May 4, 1936

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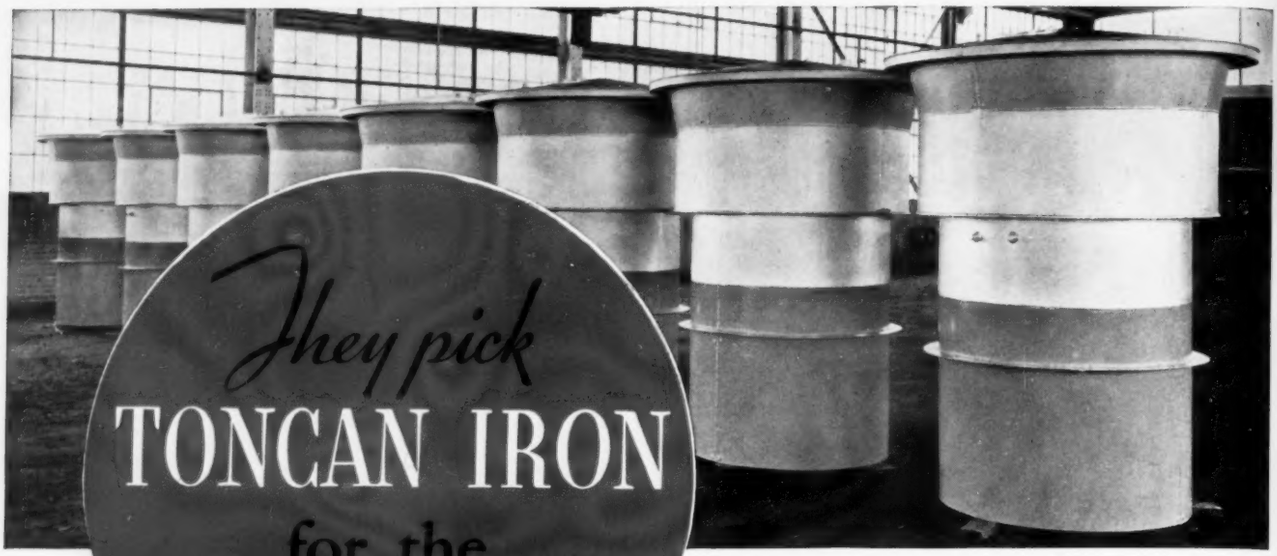

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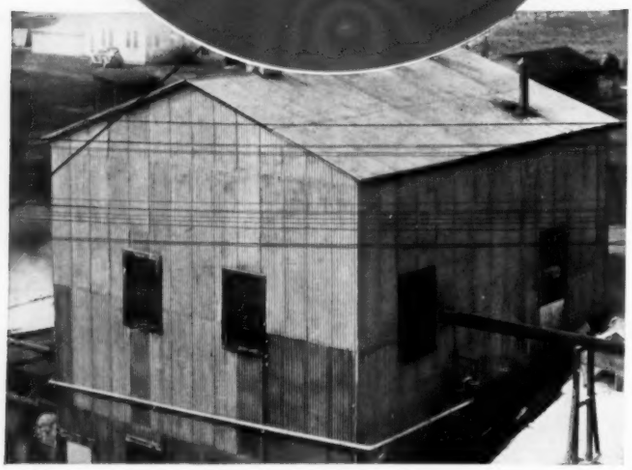

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STEEL

PRODUCTION • PROCESSING • DISTRIBUTION • USE

For forty-eight years—IRON TRADE REVIEW

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CUTS COSTS — MOLY — Mo-lyb-den-um CREATES SALES

As the Editor Views the News

FOR some unknown reason Washington has gone on another wild spree of recklessness. It may be caused by the touch of spring in the air, by simple political cockiness or by another outburst of brain trust enthusiasm. Whatever the reason, the administrative and legislative branches of the government again seem to be engaged in a contest to see which can propose the most impractical ideas. Dozens of public servants, from the President down to obscure congressmen, are making speeches or introducing bills which are charged with economic dynamite. The pity of it is that the voice of opposition to this claptrap is woefully weak.

• • •

Absurd, Yet Few Protest It!

For instance, the high point of President Roosevelt's Jefferson day address was a statement of economic philosophy so shocking that one would have expected an immediate wave of criticism from the thinking public. He stated dogmatically (p. 37) that reducing costs of manufacture means less purchasing power and fewer goods consumed. Nothwithstanding the absurdity of this statement, it has been challenged by comparatively few observers. One explanation may be that the President has shifted his economic thinking so frequently that persons who should protest against fallacious doctrines no longer think it is worthwhile to keep up with his reckless change of base.

• • •

A Bid for Nationalization

The wildness of congress is reflected by the insane desire to pass a bad tax bill, the renewed effort to re-introduce the $3,000,000,000 Frazier-Lemke inflation bill, and the introduction in the house of the astounding Wood bill to nationalize the structural steel fabricating and erection industry. This proposal (H. R. 12499), introduced last Tuesday, would create (p. 22) a federal commission of five, appointed by the President, possessing power to license all companies, to establish a system for filing bids, to control labor policies and to otherwise exercise almost dictatorial control over the industry. On its face, the bill looks like an attempt to unionize the structural steel fabricating industry under the cloak of an anti-monopoly movement. Like so many other current bills, its tone is vindictive, malicious and destructive. It cannot possibly help to solve the problems that need solution.

• • •

Demagogues Riding High

There is something radically wrong in a situation which permits political demagogues to rise to such absurd heights of arrogance. We may ask ourselves whether the mere fact that this is an election year is justification for sound congressmen—Democrats and Republicans alike—to remain silent while the fanatics of congress preach destructive doctrines and introduce crippling legislation. Is the new deal publicity machine doing its work of poisoning the public mind so successfully that honest Democrats and Republicans do not dare speak up in protest for fear they cannot be elected? There are several hundred red blooded men in congress who should be opposing fanaticism at every point. Why do they hold their fire?

• • •

Profits Below Expectations

Earnings statements for the first quarter (p. 24) run all the way from good to poor, but in general they are disappointing. Most of them (p. 24) reflect three unusual factors—first, the extremely low prices of January and February; second, the extremely cold weather of those months; and third, the floods of mid-March. Of the three, the influence of price probably made the heaviest inroads upon profits. This is indicated by the fact that the net earnings, in most cases, were not commensurate with the volume of shipments. Fortunately the outlook for the second quarter (p. 77) is more promising. The price situation, thus far, is more stable and the volume is more gratifying than at any time since 1930.

E. L. Shaner

Labor Control of Structural Fabricating Industry Sought

VIRTUAL nationalization of the structural steel fabricating industry is proposed in a bill introduced in the house of representatives at Washington last week by Rep. Reuben T. Wood, former cigar maker and labor lobbyist of Springfield, Mo.

Entitled, "A Bill to stabilize the structural steel fabricating and erection industry, to prevent monopoly conditions and practices therein, to provide for the general welfare, and for other purposes," the measure has been referred to the house committee on interstate and foreign commerce.

Commission to Dictate

Not in years has so radical a measure affecting the iron and steel industry been introduced in congress. To a national structural steel fabricating and erection commission, composed of five $12,000-a-year members, are delegated extraordinary powers over prices, labor, production and marketing phases of the structural steel and ornamental steel products industry. The commission is empowered to:

Develop a general program for coordinating and stabilizing the industry.

Create a bureau to receive copies of all structural steel bids to insure that independent fabricators are charged no more for their plain material than fabricating subsidiaries of steel producers.

Fix minimum and maximum prices.

License all fabricators.

Virtually unionize the fabricating industry.

Impose a 30-hour work week.

Increase wages to offset mechanization.

Regularize employment to insure an adequate annual wage.

Allocate production.

Control intrastate as well as interstate business.

Appoint trustees to operate plants whose licenses have been revoked.

Compel the submission of all records, data, etc.

Suspend antitrust laws for licensees.

Neither the official organization of fabricators nor individual fabricators themselves would comment last week on the Wood bill, pending a more thorough study of its provisions and some statement explaining its origin. However, it was generally deduced that the bill was primarily a labor measure, inasmuch as labor provisions are dominant and the fabricating and erecting industries have been predominantly open shop for many years.

To the extent that the bill attempts to level off prices quoted on plain structural material, it meets certain objections long raised by some independent fabricators. The latter have frequently voiced protests at having to pay the market price for plain material, and to sell in competition with fabricating interests which are subsidiaries of steel producers and obtain their own plain material at undisclosed but probably intracompany prices.

However, the Wood bill goes so much farther than meeting this one issue, especially in its onerous labor provisions that independent fabricators would be hamstrung relatively as much as their larger competitors. In fact, at their smaller isolated plants they could probably be picked off easier by labor organizers than the larger units of the fabricating and erection industry.

No date has yet been set by the interstate and foreign commerce committee for a hearing. Sam Rayburn, Democrat of Texas, is chairman of the committee, on which are 19 Democrats and 8 Republicans. He is known for his work in connection with the "death sentence" for utilities in the stock regulation law.

Former Labor Lobbyist Drafts Fabricators' Bill

REUBEN TERRELL WOOD, Democratic representative from Springfield, Mo., author of the bill, boasts of a long record in the service of labor. At an early age he entered the cigar industry; in 1912, when he was only 28, he was elected president of the Missouri Federation of Labor, serving until 1935; he lobbied for labor at every session of the Missouri legislature from 1913 to 1933, "sponsoring legislation in the interests of the wage earner, farmer, and small business man," as he states in the Congressional Directory. He led the fight for the workmen's compensation law in Missouri. In 1919-20 he lobbied at Washington for railroad employes. During the World war he was associated with the fuel and food administrations in Missouri. He is now serving his second term in congress, and is a member of the house committees on labor, pensions, war claims, and the District of Columbia.

Digest of Wood Bill

FINDINGS AND POLICY

Section 1. (a) Congress finds the following facts:

(1) Production of fabricated structural and ornamental steel products and their distribution and erection is effected with a national public interest.

(2) The flow of rolled steel shapes and other raw materials, their manufacture into structural and ornamental steel products, and their sale, transportation, distribution and erection constitute a continuous stream or current of commerce among the several states and between the states and foreign countries.

(3) Our representative basic structural steel fabrication and erection companies, with units for the production and erection of steel, while located in a number of states, in a real economic and commercial sense are integrated and operated on a national basis through holding companies or other corporate devices.

(4) "A national control over money and credit facilities is concentrated in private banking, and other agencies, which as fiscal agents, directors, and officers influence and take part in the formulation of marketing, labor, and other policies of such corporate and other entities engaged in the fabricating and erection of steel for interstate commerce."

(5) As the result of such development and operation of the structural steel fabricating and erection industries "there exist inner private and concealed controls, affecting wages, hours of work, other conditions of employment of labor, prices and production, which are used to establish monopoly conditions in the distribution and erection of structural steel products which discriminate against independent fabricators and erectors by restricting their markets and supplies, and destroy unions . . .; and exploit consumers through restrictions in production and excessive prices; which monopolistic practices cannot be effectively subordinated to the public interest without legislation by the congress . . . ."

It is, therefore, declared the policy of congress to prevent inequality in competition, establish minimum rates of pay, maximum hours of work, protect industrial rights of employes, provide for stabilization and co-ordination of production and consumption of structural and ornamental steel.

DEFINITIONS

Section 2. Defines such terms as business, interstate commerce, etc.

ADMINISTRATIVE AGENCIES

Section 3. (a) Creates the national structural steel fabricating and erection commission, consisting of five members appointed by the President, three to be representatives of the public and one each of employers and employes, for five-year terms, salary $12,000.

(b) Authorizes the commission to organize without regard to provisions of civil service laws.

(c and d) Further authorization to organize.

(e) Directs commission "to develop a general program for the co-ordination, stabilization, and orderly development of the structural steel fabricating and erection industries."

(f) "Any fabricating plant submitting bids for structural steel on an erection basis, or, any subsidiary of a fabricating plant or corporation submitting bids on the same basis, shall include in their bids as a separate item the cost of fabricated shapes at the same price charged to outside erectors or bidders for the same fabricated shapes at the point of delivery for erection purposes, for either buildings or bridges, or other purposes, and the commission shall create a bureau to receive and compare copies of such bids, and to scrutinize the same for the purpose of determining whether bids submitted for the erection of structural steel shapes, and similar products, made by steel fabricating plants or their subsidiaries, contain the identical prices for such structural steel shapes or similar products, as are quoted for the purchase in the open market to independent erecting firms or contractors who may or may not enter bids in competition with steel fabricating plants or their subsidiaries; and all such bids, after awards have been made, shall be made available for public examination by the commission."

(g) Commission shall investigate method of distribution of shapes, including the basing point system; shall issue regulations to prevent unfair competitive and monopolistic prices; shall establish "minimum prices of structural steel shapes for each marketing area determined by the commission, such minimum prices to be not less than the weighted average of the total costs of production of structural steel shapes produced in each area for the 12 months prior to the date of the beginning of the investigation by the commission; the minimum prices so established shall reflect, as nearly as possibly, the relative market value of the various kinds, qualities, and sizes of structural steel shapes; shall be just and reasonable as between the producers in each producing and competitive area established by the commission; shall be just and equitable, and not unduly prejudicial or preferential, as between, or among, competing areas; and shall have due regard to the interests of the public."

(h) When the public interest impels, the commission is authorized to establish maximum prices for structural steel shapes to protect purchasers against unreasonably high prices, "such maximum prices to be established at a uniform increase above the minimum prices in effect within the area at the time, so that in the aggregate the maximum prices shall yield a reasonable return above the weighted average total cost of production of the competitive area or areas; Provided, that no maximum prices shall be established for any plant which shall not return cost plus a reasonable profit."

Provision is made for appeal against any prices established.

(i) Fabricators must not enter bids at less than district prices provided previously.

(j) Copies of all bids must be filed in duplicate with the commission, to be made public one week after awards have been made.

LICENSES

Section 4. Makes it unlawful for any corporation engaged in the fabrication or erection of steel to engage in interstate commerce unless licensed by the commission.

CONDITIONS OF LICENSES

Section 5. Licenses shall contain these conditions:

(a) Standard provisions of right of labor to organize for collective bargaining.

(b) Standard provisions requiring employers to recognize representatives of a majority of employes.

(c) Commission has right to conduct an election to enable employes to designate representatives for collective bargaining.

(d) Maximum work week fixed at five days of six hours each, except the secretary of labor may issue exemption permits for special conditions.

(e) Female employes must receive equal wages and rights for equal work.

(f) Standard provisions prohibiting employment of minors under 16 years and against employment of persons under 18 years between 7 p.m. and 7 a.m.

(g) In fixing rates of pay, hours of work, etc., employers must make adjustments "in accordance with gains in the productive efficiency of industry arising from increased mechanization, improvements in technological methods, or from other causes, to the end that employes shall have an equitable participation in the output of industry, and that employment and mass purchasing power may keep pace with the productive accomplishment of industry."

(h) If collective bargaining does not establish acceptable wage scales the commission may establish minimum wages, and regularize employment to insure an adequate annual wage.

(i) Licenses may contain federal trade commission standards of fair trade practices.

(j) Commission may control or allocate production or control prices.

Section 6. (a, b and c) Details concerning issuances of licenses and granting of blanket licenses.

Section 7. Provision extending to intrastate business controls identical with those of interstate business.

REVOCATION OF LICENSES

Section 8. Authorizes commission to revoke licenses for cause, and prescribes methods of apepal.

APPOINTMENT OF PUBLIC TRUSTEES

Section 9. (a, b and c) If the commission finds that in order to protect the public interest and maintain employment it is necessary to continue business operations that would otherwise be interrupted by revocation of a license, the commission may appoint public trustees with full powers to manage and conduct such business.

INVESTIGATIONS

Section 10. (a, b, c, d, e, f, g) Implements commission with power to exact truthful and responsive answers to interrogatories and to compel submission of books, records, etc., in event of disagreement with licensees and the commission.

SUSPENSION OF ANTI-TRUST LAWS

Section 11. While the act is in effect and for 60 days thereafter, licensees are exempted from provisions of the antitrust laws.

RULES AND REGULATIONS

Section 12. Commission is authorized to prescribe any necessary rules and regulations to enforce the act.

MODIFICATION AND AMENDMENT OF CODES, AGREEMENTS, RULES AND REGULATIONS

Section 13. Commission is empowered to cancel or modify any license.

SEPARABILITY

Section 14. If any provision of the act is held invalid the remainder is in effect.

Housing

PITTSBURGH and Cleveland last week reported progress in furthering the steel house.

Amid considerable publicity, centering about full page ads in the Pittsburgh daily papers, National Houses Inc., began an exhibit at Pittsburgh last Tuesday of what it termed the "First all-Pittsburgh all-steel house." The unit was set up in Joseph Horne Co. department store and listed the following Pittsburgh firms as represented in the construction of this unit: American Sheet & Tin Plate Co., H. H. Robertson Co., Aluminum Co. of America, Allegheny Steel Co., Pittsburgh Plate Glass Co., McKinney Mfg. Co., and others.

In Cleveland, Cleveland National Houses, of which N. Z. Mills is manager, began erection of an all-steel house in the William Taylor Son & Co. store and announced plans to erect 500 all-steel prefabricated houses in the coming year. Cleveland National Houses is a subsidiary of National Houses Inc., New York. Sanymetal Products Co., Cleveland, is expected to provide steel for these.

Plan "Verity Day"

Civic leaders of Middletown, O., are arranging for a George M. Verity Day early in June to honor the chairman of the American Rolling Mill Co. Meeting recently, these leaders sent a message of congratulation to Mr. Verity on the anniversary of his birthday and decided further to hold a celebration in the nature of a community picnic, probably in Armco park, donated to Middletown through Mr. Verity's generosity. D. E. Harlan is chairman of the celebration committee. This is the thirty-fifth anniversary of the operation of the first American Rolling Mill Co. plant in Middletown.

Table Healey Bill

House judiciary committee has voted to table the Healey bill, which is the house substitute for the Walsh government contract bill. Unless something unusual occurs, this indicates that no action will be taken at this session on hour and wage provisions of government contractors.

First Quarter Net $1.38 per Ton; Improvement Is Spotted

FIRST 14 integrated producers of steel, representing 57,624,000 gross tons of ingot capacity of 83 per cent of the country's total, to report for the first quarter show an aggregate net profit of $10,791,502 for that period.

In the first quarter of 1935 the identical producers made only $5,711,898, but in the fourth quarter of 1935 their earnings aggregated $18,436,010.

Assuming the experience of these 14 producers to be typical, the indicated net earnings of the entire industry, after all charges, in the first quarter were $12,980,000, or $1.38½ per ton on the 9,636,731 tons of ingots produced. In the first quarter of 1935 the indicated net of the entire industry was $6,825,000, or 80 cents per ton of ingots produced.

Five Show Sharp Gain

Of the 14 integrated producers reporting thus far, only five bettered their position over the first quarter of 1935, but the improvement of these five was so pronounced that they outweighed the less favorable showing of the other nine.

The five to report a gain over last year were United States Steel Corp., Bethlehem Steel Co., Youngstown Sheet & Tube Co., Colorado Fuel & Iron Corp., and Gulf States Steel Co.

This year, however, only two companies went into the red, compared with five a year ago.

For the inferior earning position of the first quarter, compared with the last quarter of last year, these reasons are most commonly given: Reduced prices, flood damage in March, curtailment of March shipments, slack releases from automobile manufacturers early in the quarter, deductions for social security levies.

The Steel corporation is not only first in size but also first in comeback. Losing $2,173,801 in the first quarter of 1935, it turned in a profit of $3,376,304 in the first quarter of 1936, an improvement of almost $5,500,000. However, like most other producers it did not fare quite so well in the first quarter of 1936 as in the last quarter of 1935. The Corporation's net income of $3,376,304 was almost double the requirement for paying 50 cents on the preferred, leaving a surplus on March 31 after this partial preferred payment of $1,574,899.

Measured by finished product output, operations in the first quarter averaged 47 per cent, making it the best first quarter since 1931. Too severe winter weather, the March flood, additional taxation and social security legislation, Myron C. Taylor, chairman, ascribes in part the reduction in net income from the concluding months of 1935.

Bethlehem, second in size, also bettered its showing over the first quarter of last year but fell considerably below the fourth quarter. Its first quarter net of $603,065 compares with a deficit of $607,298 in the first quarter a year ago and a profit of $2,396,026 in the fourth quarter.

Commenting on current operations, at 65 per cent, E. G. Grace, president, said he expected the second quarter to average about that. Mr. Grace disclosed that automotive releases for May and June are heavy, that demand for heavy steel is improving, requirements for housing are disappointing, oil country goods are moving better, and some tank ship tonnage is in prospect.

Cost of repairing flood damage is estimated at $1,150,000, which is being charged up to the reserve for contingencies, but income for the first quarter was affected by the suspension of operations and lower volume of shipments caused by the March flood.

Republic's earnings eased off both from the last quarter and the first quarter of 1935, being $361,031 compared with $1,834,235 a year ago, and $1,191,439 in the fourth quarter. Among the adverse influences were lower prices, the reduced operating rate in January and February caused by extreme cold weather and curtailment of automobile production, and a temporary additional interest charge of $286,000, incident to the refunding of bonds.

Another item of expense reflected in Republic's statement for the first time was $155,000 for unemployment insurance taxes. This is expected to amount to about $600,000 for the full year.

Weather Hampered Shipments

For its deficit of $933,279, compared with a loss of $794,789 in the first quarter of 1935, Jones & Laughlin unofficially blames the unusually severe winter. Among other things, freezing weather prevented river communication between the Pittsburgh and Aliquippa plants for more than a month.

A wonder worker among the larger producers is Sheet & Tube, whose net in the first quarter, after charges, of $1,897,229 contrasts with a loss of $595,770 in the first quarter of 1935 and earnings of only $1,493,734 in the fourth quarter of 1935. Incidentally, Henry G. Dalton, chairman, said at the annual meeting of stockholders in Youngstown Tuesday that the company is studying

First Quarter Financial Statements Compared

All figures are earnings, except where asterisk denotes deficit.

	First Quarter 1936	First Quarter 1935	Fourth Quarter 1935	Ingot Capacity gross tons
United States Steel Corp.	$3,376,304	$2,173,801*	$5,326,417	26,657,000
Bethlehem Steel Co.	603,065	607,298*	2,396,026	9,360,000
Republic Steel Corp.	361,031	1,834,235	1,191,439‡	6,053,000
Jones & Laughlin Steel Corp.	933,279*	794,789*	117,747*	3,660,000
Youngstown Sheet & Tube Co.	1,897,229	595,770*	1,493,734	3,120,000
National Steel Corp.	2,377,145	3,367,633	2,532,693	2,240,000
Inland Steel Co.	1,934,632	2,455,797†	2,749,309	2,000,000
Wheeling Steel Corp.	10,922	934,571	1,246,158	1,750,000
Colorado Fuel & Iron Corp.	726,270	51,490	166,272	888,000
Otis Steel Co.	148,676	952,362	868,212	828,000
Gulf States Steel Co.	96,929	30,148	119,350	480,000
Granite City Steel Co.	61,217	134,581	203,358	400,000
Wickwire Spencer Steel Corp.	121,651*	75,782*	107,123	150,000
Ludlum Steel Co.	163,012	198,521	153,666	38,000
Total	$10,791,502	$5,711,898	$18,436,010	57,624,000
FINISHING CAPACITY ONLY				
Superior Steel Corp.	29,088	38,511	79,216	.....
Eastern Rolling Mill	8,420	4,633	41,156	.....
Acme Steel Co.	391,853	601,990	438,155	.....
PIG IRON CAPACITY ONLY				Pig Iron
Interlake Iron Corp.	17,301	69,552*	238,424	1,215,000
Virginia Iron, Coal & Coke Co.	21,446*	8,950	28,207*	200,000

‡ Includes Corrigan-McKinney after Sept. 25.
† Does not include Joseph T. Ryerson & Son Inc.

plans for retiring back dividends on the preferred, which, after the current payment of $1.75, amount to $19.25 per share; total $2,887,500.

Mr. Dalton also announced $1,300,000 has been authorized for increasing tin mill capacity at Indiana Harbor and installation of a new turbine at the Campbell (Youngstown) plant. Sheet & Tube is retiring $84,962,000 first mortgage bonds through a new issue of $60,000,000 first mortgage bonds and $30,000,000 in convertible debentures.

By a narrow margin, Inland fell short of its showing of a year ago, earning $1,934,632 in the first quarter, against $2,455,797 a year ago, the latter figure, of course, not including Ryerson. In the 12 months ended March 31, Inland's net profit has been $8,886,653. A dividend of 75 cents will be paid June 1 to record of May 15.

Colorado Fuel & Iron, under the trusteeship of Arthur Roeder, has relatively the best showing of any of the larger integrated producers. Its net of $726,270 in the first quarter is a gain over both the profit of $51,490 in the first quarter a year ago and the net of $166,272 in the fourth quarter.

Reorganized as the Colorado Fuel & Iron Corp., instead of company, and with adjustment made in its financial structure, the following have been elected directors: Arthur Roeder, John Evans, Bertram Cutler, Fred Farrar, W. A. Maxwell Jr., S. G. Pierson, Cyril J. C. Quinn, Carl J. Schmidlapp and J. F. Welborn. All are holdover members, with the exception of Messrs. Cutler, Evans, Quinn, and Schmidlapp.

CHAIN BELT LIFTS DIVIDEND

Chain Belt Co., Milwaukee, will pay a dividend of 50 cents May 15 to record of May 1. It paid 20 cents Feb. 15. Dividends in 1935 totaled $1.30. First quarter sales are understood to have shown an appreciable increase over a year ago. Profits in 1935 totaled $362,000, against $209,000 in 1934. Dividends have been paid continuously since 1902, and in only three years since the company's organization in 1892 has it failed to show a profit, these being 1931, 1932 and 1933.

UNITED'S ORDERS AT $10,000,000

President George T. Ladd of United Engineering & Foundry Co., Pittsburgh, told stockholders at their annual meeting, April 28, that the company's volume of unfilled orders was valued at $10,000,000, compared with $4,000,000 a year ago at this time.

HOSKINS IN SLIGHT GAIN

Hoskins Mfg. Co., Detroit, reports net profit of $113,021 during the first quarter, against $105,835 in the corresponding period a year ago.

Allegheny-West Leechburg Merger Certain of Approval

ALLEGHENY STEEL CO. directors have authorized the calling of a special stockholders' meeting in Pittsburgh, May 20, for the discussion and approval of the proposed merger agreement between the company and West Leechburg Steel Co., Pittsburgh.

Early last week an announcement was made by Harry E. Sheldon, president of Allegheny, and James Lippincott, chairman of the board of West Leechburg, of a proposed merger of the two companies to be known as the Allegheny Steel Co., subject to the formal approval of stockholders of both companies.

West Leechburg stockholders' approval is expected to be perfunctory inasmuch as the stock in this company is closely held in the families now identified with its management. Furthermore, it is generally expected that Allegheny stockholders also will approve the recommendation of their directors.

Merging of these two organizations will bring together two of the leading independent steel producers in the Pittsburgh district, which are noncompetitive.

Concentrates on Strip Steel

West Leechburg, with an annual finishing capacity of 250,000 tons, is concentrated in hot and cold-rolled strip steel, has no steel ingot producing facilities, and purchases its semi-finished requirements in billet form in the open market.

Allegheny, on the other hand, has complete steelmaking equipment in the form of an annual ingot capacity rating of 476,000 tons, which is sufficient to care for the combined finishing requirements of both companies. Preponderantly Allegheny's finishing capacity is in sheets and tubular products, with no facilities for the commercial production of hot and cold-rolled strip steel.

Furthermore, the two plants are located in close proximity. The Allegheny plant is on the Allegheny river at Brackenridge, Pa., and West Leechburg's plant is on the Kiskiminetas river at West Leechburg, Pa., 12 miles away.

Allegheny's acquisition of West Leechburg's strip mills will provide an experienced organization and complete facilities for the production of hot and cold rolled strip in all qualities and grades to the capacity of approximately 20,000 tons per month, and in finished sheet up to 72-inch width at capacity better than 18,000 tons per month.

Directors of both companies have not yet announced the terms of the consolidation. Allegheny's financial setup lists, as of Dec. 31, 1935, 611,095 shares of no-par common stock outstanding, 33,426 shares of $100 preferred stock, and no funded debt. Allegheny's capital and earned surplus account is listed at $9,807,029, giving a total capitalization of $16,969,204.

West Leechburg has no preferred stock or bonds outstanding, and its capital structure is exceedingly simple as it has about 25,000 $100 par common shares closely held among a few holders. When the merger of the two companies is approved, the present West Leechburg company will be represented with two members on the board of directors of the Allegheny Steel Co.

Consolidation Long Expected

Steel circles have long expected that this consolidation would eventually take place. West Leechburg has rolled skelp on its mills for Allegheny's tube mill requirements in part for some time, and in turn has handled the sale of Allegheny stainless steel strip. Furthermore, the proximity of the two plants is a factor in the merger's favor.

However, announcement of the consolidation came as a distinct surprise to not only the general public but also to employes of both companies. A week ago last Saturday, April 25, district representatives of both companies were summoned to the Allegheny company's Pittsburgh headquarters for a meeting on Sunday, April 26, at which time the merger details were announced.

Drawback Is Extended

A former treasury decision covering steel containers (drums and barrels) manufactured by Wilson & Bennett Mfg. Co., Chicago, at its New Orleans plant with the use of imported sheet steel has now been extended to provide for the same allowance on steel drums manufactured at its factory at Jersey City, N. J., with the use of imported sheet steel.

Steel Exports in March Show Gain

EXPORTS of steel products in March were 264,337 gross tons, compared with 213,802 gross tons in February, a gain of 50,535 gross tons, part of which is attributable to the longer month, according to the metals and minerals division of the department of commerce. Of this gain, scrap contributed 22,451 gross tons, and finished and semifinished steel 28,084 gross tons.

For first quarter, exports totaled 719,703 gross tons in 1936 and 814,294 gross tons in 1935, a decline of 94,591 gross tons. However, finished and semifinished steel exports showed a gain of 9388 tons for first quarter of 1936 and scrap a loss of 103,979 gross tons compared with first quarter of 1935.

Gains in March over February were registered in a number of classifications, representative of which are the following: Tin plate from 12,866 tons to 23,444 tons; black sheets from 9300 tons to 14,538 tons; shapes from 529 tons to 2413 tons; rails over 50 pounds from 3942 tons to 7750 tons; plain wire from 1137 tons to 2368 tons; galvanized wire from 785 tons to 1179 tons.

United Kingdom took the largest tonnage of scrap exported in March, 79,820 gross tons, with Japan second with 61,620 tons and Italy third with 18,328 tons. Canada was a distant fourth with 3195 tons.

UNITED STATES EXPORTS OF IRON AND STEEL SCRAP, TIN PLATE SCRAP AND WASTE-WASTE TIN PLATE

Gross Tons

	Mar. 1936	Feb. 1936	Jan. thru Mar.'36
Belgium	121	.....	206
France	.....	.....	102
Germany	183	56	314
Greece	.....	15	15
Italy	18,328	50,791	125,904
Netherlands	70	166	2,652
Poland and Danzig	.....	.....	2,192
Spain	.....	.....	.....
Sweden	.....	.....	.....
United Kingdom	79,820	52,603	163,332
Yugoslavia	.....	.....	6,055
Total Europe	98,522	103,631	300,772
Canada	3,195	3,261	9,668
Guatemala	.....	6,372	6,372
Mexico	1,022	636	2,265
Jamaica	.....	.....	.....
Other Brit. W. Indies	5	.....	5
Total No. and Cent. America and W. Ind.	4,222	10,269	18,310
Argentina	.....	.....	.....
Colombia	511	.....	511
Total So. America	511	.....	511
British India	.....	.....	1,058
China	2,148	743	3,602
Netherland India	.....	.....	363
Hong Kong	207	60	267
Iraq	.....	.....	11
Japan	61,620	29,258	144,611
Kwantung	.....	.....	584
Palestine	60	.....	60
Philippine Islands	.....	.....	.....
Turkey	45	81	141
Total Asia & Oceania	64,080	30,142	150,697
Union of S. Africa	20	.....	69
Egypt	.....	800	800
Mozambique	98	160	258
Total Africa	118	960	1,127
Grand Total	167,453	145,002	471,417

UNITED STATES EXPORTS OF IRON AND STEEL PRODUCTS

Gross Tons

Articles	Mar. 1936	Feb. 1936	Jan. thru Mar.'36
Pig iron	260	51	497
Ferromanganese and spiegeleisen	.....	1	8
Other ferroalloys*	110	146	530
Ingots, blooms, etc.	969	314	1,378
Bars, iron	78	75	271
Bars, concrete†	166	57	473
Bars, other steel‡	3,689	4,711	11,563
Wire rods	4,042	1,786	9,767
Boiler plate	193	229	637
Other plate, not fab.	4,494	4,892	12,576
Skelp, iron or steel	919	1,525	3,256
Iron sheets, galv.	66	98	294
Steel sheets, galv.	3,773	3,404	13,472
Steel sheets, black	14,538	9,306	32,660
Iron sheets, black	723	635	1,974
Strip steel, cold-rolled	2,394	2,002	6,857
Strip steel, hot-rolled	2,210	2,365	7,068
Tin plate, taggers' tin	23,444	12,866	54,335
Terne plate	193	203	829
Tanks, except lined, etc.	3,147	2,276	7,503
Shapes, not fab.	3,840	3,880	11,068
Shapes, fabricated	2,413	529	3,993
Plates, fabricated	47	120	296
Metal lath	53	35	161
Frames and sashes	61	156	328
Sheet piling§	439	129	853
Rails, 60 lbs. and over¶	7,750	3,942	15,658
Rails, under 60 lbs.¶	323	166	853
Rail fastenings	601	259	1,277
Switches, frogs, crsgs.	79	61	324
Railroad spikes	178	315	714
Railroad bolts, nuts, etc.	53	37	160
Boiler tubes, seamless	436	341	1,198
Boiler tubes, welded	95	4	137
Casing and oil-line pipe, seamless	852	970	3,639
Do., welded	231	23	580
Seamless black pipe, other than casing	427	201	969
Malleable iron screwed pipe fittings	252	181	660
Cast iron, Do.	170	181	442
Cast iron pressure pipe and fittings for	892	205	1,610
Cast iron soil pipe, Do.	700	302	1,183
Welded black steel pipe	432	637	3,800
Welded black wrought iron pipe	137	47	394
Welded galv. steel pipe	449	706	2,214
Welded galv. wrought iron pipe	130	62	369
Riveted iron or steel pipe fittings	33	67	239
Plain iron or steel wire	2,368	1,137	5,999
Galvanized wire	1,179	785	4,500
Barbed wire	2,626	2,374	6,513
Woven wire fencing	235	180	646
Woven wire screen cloth	85	74	233
Wire rope	208	183	800
Other wire mfrs.	409	488	1,262
Wire nails	569	674	1,918
Horseshoe nails	49	53	157
Tacks	31	15	80
Other nails, incl. staples	162	167	482
Ordinary bolts, mach. screws, rivets, washers	540	448	1,449
Iron castings	592	913	2,351
Steel castings	171	209	590
Car wheels, tires, exles	704	366	1,355
Horseshoes and calks	48	4	53
Iron and steel forgings, n. e. s.	427	232	1,341
Total gross tons	96,884	68,800	248,286
Iron and steel scrap	163,295	142,165	459,366
Tin plate scrap	2,544	1,313	6,318
Waste-waste tin plate	1,614	1,524	5,733
Total gross tons	167,453	145,002	471,417
Grand total all iron and steel products	264,337	213,802	719,703

*New class. No comparable figures for previous year.

†New class. Previously included under former classification "Steel Bars."

‡New class. Includes alloy, non-alloy and stainless steel bars (excepting concrete reinforcement bars).

§New class. Previously included with "Frames and Sashes."

¶Previously shown at "50 pounds."

Production

STEEL production held firm last week at 69½ per cent, with all districts maintaining steady schedules, with the exception of Youngstown, which went off 1 point to 78 per cent, eastern Pennsylvania and Chicago each up ½ point, and New England up 3 points. Tentative schedules at Youngstown, and Chicago point to a slight recession this week. Further details follows:

Youngstown—Dipped 1 point last week to 78 per cent, and operations were expected to go to 76 per cent at this week's start, due to the suspension of a bessemer furnace. Carnegie-Illinois Steel Corp. announces it will rebuild No. 1 blast furnace at its Ohio works at a cost of $360,000. Youngstown Sheet & Tube Co. will have a blast furnace at its Brier Hill works ready for relighting within a week.

Chicago—Up ½ point to 71 per cent last week, as two independent furnaces were put on the active list. Operations may decline slightly this week, since at least one steel interest may be forced to take off one or two furnaces for repairs.

Cleveland-Lorain—Unchanged at 79½ per cent, Republic Steel Corp. continuing with 12 open hearths, Otis Steel Co. 8, and National Tube Co., Lorain, 11. Since National Tube booked 42,000 tons of 22-inch pipe some weeks ago it has had to retain practically all its raw steel supplies, instead of shipping a surplus to the Cleveland plant of the American Steel & Wire Co. Steel for this plant recently has been shipped from the Pittsburgh district. Republic is operating four blast furnaces; Otis, two; National, three.

New England—Up 3 points to 78 per cent, with expected increase to 85 per cent this week.

Central eastern seaboard—Ad-

Steelmaking Operations

Percentage of Open-Hearth Ingot Capacity Engaged in Leading Districts

	Week ended May 2	Change	Same week 1935	Same week 1934
Pittsburgh	63	None	37	48
Chicago	71	+ ½	51	62½
Eastern Pa.	44½	+ ½	28½	44½
Youngstown	78	— 1	50	61
Wheeling	92	None	79	79
Cleveland	79½	None	54	80
Buffalo	70	None	27	66
Birmingham	69	None	54½	52
New England	78	+ 3	30	89
Detroit	100	None	82	94
Cincinnati	84	None	†	†
Average	69½	None	44	60

†Not reported.

vanced ½ point last week to 44-45 per cent. Most leading trade interests regard present operations as at a peak for the time being at least. In fact, most believe that the general trend over the remainder of the quarter will be on the down side, although few look for any material drop.

Detroit—Steady at 100 per cent through last week. The two producers here, accounting for 17 open-hearth furnaces, have all of their units making ingots.

Wheeling—Unchanged at 92 per cent last week, holding at a continuation of the 1936 high for this district, which was established the week preceding. Out of 37 open-hearth furnaces in four district plants, 34 were producing steel.

Pittsburgh—Unchanged at 63 per cent, due primarily to the steady rate of production by both leading interests. The leading Pittsburgh producer started schedules last week at 64 per cent, and the leading independent at 62 per cent. The second leading independent averaged operations at 60 per cent throughout the week and some of the smaller mills presented an average in aggregate of 60-65 per cent. Tin plate operations are leading among finishing mill schedules at 90 per cent, followed by sheets at 70-75 per cent, strip at 60-65 per cent, tube mill capacity at 50 per cent, and varying rates in other products.

Thirty-five out of 60 steelworks blast furnaces continue active.

Buffalo—Held at 70 per cent last week, and will probably hold steady this week. Heavy demand from the automotive trade and a steady flow of orders from other classes of consumers is reported. Twenty-six open hearths are in production.

Birmingham—Remained at 69 per cent last week, with little change indicated for the immediate future.

Cincinnati—Unchanged, at 84 per cent, with 20 out of 24 open hearths producing. An unaltered schedule is on order this week.

RATE OF OPERATION

(Relation of Production to Capacity)

	1936[1]	1935[2]	1934[3]	1933[4]
Jan.	48.2	34.2	28.3	13.3
Feb.	46.6	41.4	32.5	14.3
Mar.	48.5	41.0	37.5	12.7
Apr.	59.1	40.0	41.4	15.1
May		40.2	47.5	20.9
June		37.2	46.3	30.6
July		35.2	28.4	42.4
Aug.		40.7	24.5	42.8
Sept.		42.5	21.5	36.4
Oct.		45.8	22.1	31.8
Nov.		49.5	22.8	26.2
Dec.		49.0	23.7	27.9

[1]Based on capacity of 49,777,893 gross tons, Dec. 31, 1935; [2]capacity of 50,845,741 gross tons, Dec. 31,1934; [3]capacity of 50,975,561 tons, Dec. 31, 1933; [4]capacity of 50,313,975 tons, Dec. 31, 1932. Capacities by American Iron and Steel institute.

17 Blast Furnaces Resume in April; Iron Up 17.9 Per Cent

WITH a net increase of 17 active blast furnaces, raising the total to the highest number in almost six years, production of coke pig iron in the United States in April increased to a rate 80,403 tons a day, a figure which also was the best in nearly six years. Active stacks on April 30 totaled 143, the largest number since July, 1930, with 144.

The April average daily production was the best since August, 1930, with 81,455 gross tons, according to STEEL's compilation of reports involving producers' estimates for the last one or two days of the month. Compared with the 66,004 tons of March, the April increase was 14,399 tons or 21.8 per cent. In April, one year ago, the rate was 55,719 tons per day.

In spite of the fact that April was a one-day shorter month than March, total production was 2,412,080 tons, an increase of 365,959 tons, or 17.9 per cent, over the 2,046,121 tons made in March. This production was the best since August, 1930, with 2,525,105 tons and compares with the 1,671,556-ton output of April one year ago. In the first four months of 1936, production has aggregated 8,326,437 tons, this being a gain of 1,790,543 tons, or 27.5 per cent, over the output of 6,535,894 tons in the corresponding period of 1935.

Relating production to capacity, the operating rate for April was 59.1 per cent against 48.5 per cent in March, 46.6 per cent in February and 40.0 per cent in April, 1935.

The increase of 17 active furnaces in April was the largest for any month since January, 1935, when 22 were placed in production. In April a year ago, only 97 furnaces were making iron. During the month 16 steelworks or nonmerchant stacks resumed operation and none was blown out. One merchant stack was blown in and none blown out.

Blast furnaces resuming in April were: In Ohio: Ohio No. 5, Carnegie-Illinois Steel Corp. In Pennsylvania: Bethlehem B, Cambria J and Cambria K, Bethlehem Steel Co.; Carrie No. 4, Duquesne No. 1, Edgar Thomson D and Edgar Thomson H, Carnegie-Illinois Steel Corp.; one Eliza, Jones & Laughlin Steel Corp.; Monongahela No. 2, National Tube Co.; and Shenango No. 1, Shenango Furnace Co. In New York: Lackawanna B, Bethlehem Steel Co. In Illinois: South Works Old No. 4, Carnegie-Illinois Steel Corp. In Indiana: Madeline No. 1, Inland Steel Co. and Gary No. 5, Carnegie-Illinois Steel Corp. In Colorado: Minequa A, Colorado Fuel & Iron Co. In West Virginia: Riverside, Wheeling Steel Corp.

AVERAGE DAILY PRODUCTION

Gross Tons

	1936	1935	1934	1933
Jan.	65,461	47,692	39,537	18,348
Feb.	63,411	57,675	45,385	19,752
Mar.	66,004	57,120	52,438	17,484
Apr.	80,403	55,719	57,873	20,786
May		55,986	66,370	28,784
June		51,949	64,563	42,165
July		49,043	39,630	58,108
Aug.		56,767	34,199	59,137
Sept.		59,009	29,969	50,264
Oct.		63,818	30,689	43,824
Nov.		68,876	31,930	36,124
Dec.		68,242	33,161	38,456
Ave.	68,813	57,694	43,774	36,223

MONTHLY IRON PRODUCTION

Gross Tons

	1936	1935	1934
Jan.	2,029,304	1,478,443	1,225,643
Feb.	1,838,932	1,614,905	1,270,792
Mar.	2,046,121	1,770,990	1,625,588
Apr.	2,412,080	1,671,556	1,736,217
Tot. 4 mo.	8,326,437	6,535,894	5,858,240
May		1,735,577	2,057,471
June		1,558,463	1,936,897
July		1,520,340	1,228,544
Aug.		1,759,782	1,060,187
Sept.		1,770,259	899,075
Oct.		1,978,379	951,353
Nov.		2,066,293	957,906
Dec.		2,115,496	1,028,006
Total		21,040,483	15,977,679

APRIL IRON PRODUCTION

	No. in blast last day of Apr.	Mar.	Total tonnage Merchant	Nonmerchant
Ohio	33	32	84,124	505,124
Penna.	46	36	63,175*	639,271*
Alabama	12	12	81,230*	91,735*
Illinois	12	11	53,100	189,460
New York	10	9	49,100	108,888
Colorado	3	2		
Indiana	12	10	3,454*	395,965
Maryland	4	4		
Virginia	1	1		
Kentucky	1	1		
Mass.	0	0		
Tenn.	0	0		
Utah	1	1	7,100	140,354
West Va.	3	2		
Michigan	4	4		
Minnesota	1	1		
Missouri	0	0		
Total	143	126	341,283	2,070,797

*Includes ferro and speiegeleisen.

Men of Industry

ALEXANDER E. WALKER, general sales manager for Republic Steel Corp., Cleveland, has been elected president of Truscon Steel Co., Youngstown, O., succeeding Julius Kahn, who has been made vice president in charge of product development for Republic. Mr. Walker will also continue as Republic's general sales manager.

Mr. Walker was graduated from the University of Michigan, Ann Arbor, Mich., in 1910, with a degree in engineering. In the spring of 1911 he went with LaBelle Iron

Alexander E. Walker

Works, Steubenville, O., then an independent steel company but now a part of the Wheeling Steel Corp. After spending five months at the Steubenville works, Mr. Walker was assigned to the Chicago sales office of the company and remained there for over four years.

In February, 1916, he went with the Republic Iron & Steel Co., Youngstown, O., as assistant to Daniel Geary in selling wrought iron steel pipe, and in 1919 was named assistant general manager of sales for Republic. Upon the resignation of W. B. Topping in 1928, Mr. Walker, who had been his assistant, was named general manager of sales.

♦ ♦ ♦

John F. Cooke has been placed in charge of sales of the hoist, pump and marine division of the American Engineering Co., Philadelphia, manufacturer of Taylor stokers, Lo-Hed hoists, A-E-CO marine auxiliaries and Hele-Shaw pumps, motors and transmissions. Mr. Cooke, a graduate of the United States Naval academy, class of 1924, has been identified with the marine division since his resignation from the United States navy in 1928.

♦ ♦ ♦

Lee W. Tremblay, Witherspoon building, Philadelphia, has been appointed sales representative for the Edward Valve & Mfg. Co. Inc., East Chicago, Ind., builder of valves for high pressures and temperatures.

♦ ♦ ♦

Robert J. Wilson, formerly president of the Kempsmith Mfg. Co., Milwaukee, manufacturer of milling machines, and more recently executive vice president of the Endestro Mfg. Co., Chicago, has been appointed general manager of the Western Metal Specialty Co., Milwaukee, maker of sheet metal stampings.

♦ ♦ ♦

George Codrington, president, Winton Engine Corp., Cleveland, has been elected a director of National Acme Co., Cleveland, to fill the vacancy caused by the death of Frank H. Hobson. He is also a director of Addressograph-Multigraph Corp., Cleveland, and the Electro-Motive Corp., LaGrange, Ill.

♦ ♦ ♦

L. E. Mustard has been appointed district manager at Detroit for the Bristol Co., Waterbury, Conn., maker of recording instruments. Born and raised in Michigan, Mr. Mustard attended the University of Michigan, and started his business career with the Westinghouse Electric & Mfg. Co., East Pittsburgh, Pa. He joined the sales and service organization of the Bristol Co. in 1923, and in the years that followed was associated with the Pittsburgh, Denver and St. Louis offices. During the past three years he served as sectional sales and service engineer, with headquarters in Dallas, Tex.

L. E. Mustard

♦ ♦ ♦

H. H. Kerr, newly-elected vice president of the American Gear Manufacturers association, is president of Boston Gear Works Inc., North Quincy, Mass.

A native of Boston, his first work was in the field of structural steel erection. He then went to work in the shipyards at Fore River, Mass., and next in an automobile plant in Boston. In 1906 he became connected with the department of the Boston Gear Works devoted to the manufacture of steering devices. He rose in the ranks of this company and on its incorporation in 1924 became vice president and assistant treasurer. Since 1929 he has been president and assistant treasurer.

H. H. Kerr

Mr. Kerr has held many offices. He served as chairman of the NRA code authority for the gear industry, and as employers' representative on the Massachusetts adjustment board of NRA. For three years he was president of the Employers Association of Eastern Massachusetts. He now is president of the Boston branch of the National Metal Trades association.

♦ ♦ ♦

Neil Metcalf, who for the past eight years has been metallurgist for the Treadwell Engineering Co., Easton, Pa., has resigned to join the staff of the Burlington Steel Co. Ltd., Hamilton, Ont., in a similar capacity.

Mr. Metcalf was educated in Great Britain, and is a graduate in metallurgy of the University of Wales, University College, Cardiff, gaining admission by means of an open scholarship.

Prior to becoming associated with the Treadwell company, Mr. Metcalf was connected with the Ford Motor Co., Detroit, and Manchester, England, and with Guest Keen & Nettlefolds Ltd., Cardiff, Wales, in the metallurgical and steelmaking departments. He received an initial general steel plant and engineering shops training with the Ebbw Vale Steel Iron & Coal Co. Ltd., England.

♦ ♦ ♦

W. N. Weaver, formerly superintendent of the Indiana Harbor plant of Youngstown Sheet & Tube Co., Youngstown, O., has been named manager of the steel plant of Northwestern Barb Wire Co., Sterling, Ill.

♦ ♦ ♦

I. Lamont Hughes, executive vice president of Carnegie-Illinois Steel Corp., formally severed his affiliation with the company, April 30. Mr. Hughes' service with subsidiaries of United States Steel Corp. has been continuous over the past 38 years. His business plans for the future have not yet been announced.

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E. C. Burke and W. A. Kendrick have been named directors of Inland Steel Co., Chicago, succeeding C. S. Eaton and C. R. Robinson.

♦ ♦ ♦

A. W. Demmler recently has been appointed metallurgical engineer in the research and development department of Vanadium Corp. of America, Bridgeville, Pa., where he has been located in various capacities for the past 13 years.

♦ ♦ ♦

John Dolza, for the past two years designing engineer for the Buick Motor Co., Flint, Mich., has been appointed assistant chief engineer of the company. Mr. Dolza succeeds Charles A. Chayne, who has been elevated to the post of chief engineer. He has been on Buick's engineering staff for the past nine years, having joined the company in 1927 as a draftsman in the body department. Since 1934 he has had complete supervision of chassis and engine design.

♦ ♦ ♦

C. R. Robinson has resigned as a director and first vice president in charge of sales of the Inland Steel Co., Chicago, effective May 1. Future plans have not been announced nor a successor named as yet.

Mr. Robinson was associated with Inland from 1904 to 1908, and from 1922 until the present. He started his career in 1890 as a salesman of tool steel for Park Brothers & Co., and in 1900 entered business for himself, handling various steel products on a brokerage basis. A salesman for Inland in 1904, in 1906 he became assistant general manager of sales, leaving in 1908 to become Chicago district sales manager for the Lackawanna Steel Co. In 1910 he was transferred to New York as general manager of sales for Lackawanna, later moving to Buffalo. He was elected vice president in charge of sales in 1918, and in 1922 rejoined Inland.

Four Are Advanced Within Bethlehem Organization

E. F. Entwisle

J. M. Sylvester

V. J. Pazzetti

J. C. MacNeill

BETHLEHEM STEEL CO., Bethlehem, Pa., has made the following promotions in its organization, effective immediately:

E. F. Entwisle has been appointed assistant general manager of the Lackawanna plant. He was formerly superintendent of the Saucon division of Bethlehem plant. Mr. Entwisle was graduated from Cornell university in 1906, and entered the employ of Bethlehem at the Sparrows Point, (Baltimore) Md., plant as mechanical engineer in 1914. He later became successively mechanical engineer at Steelton plant, general superintendent of the then blast-furnace division of Lebanon plant, and assistant general manager of Steelton plant. He came to Bethlehem plant as superintendent of the Saucon division in 1928.

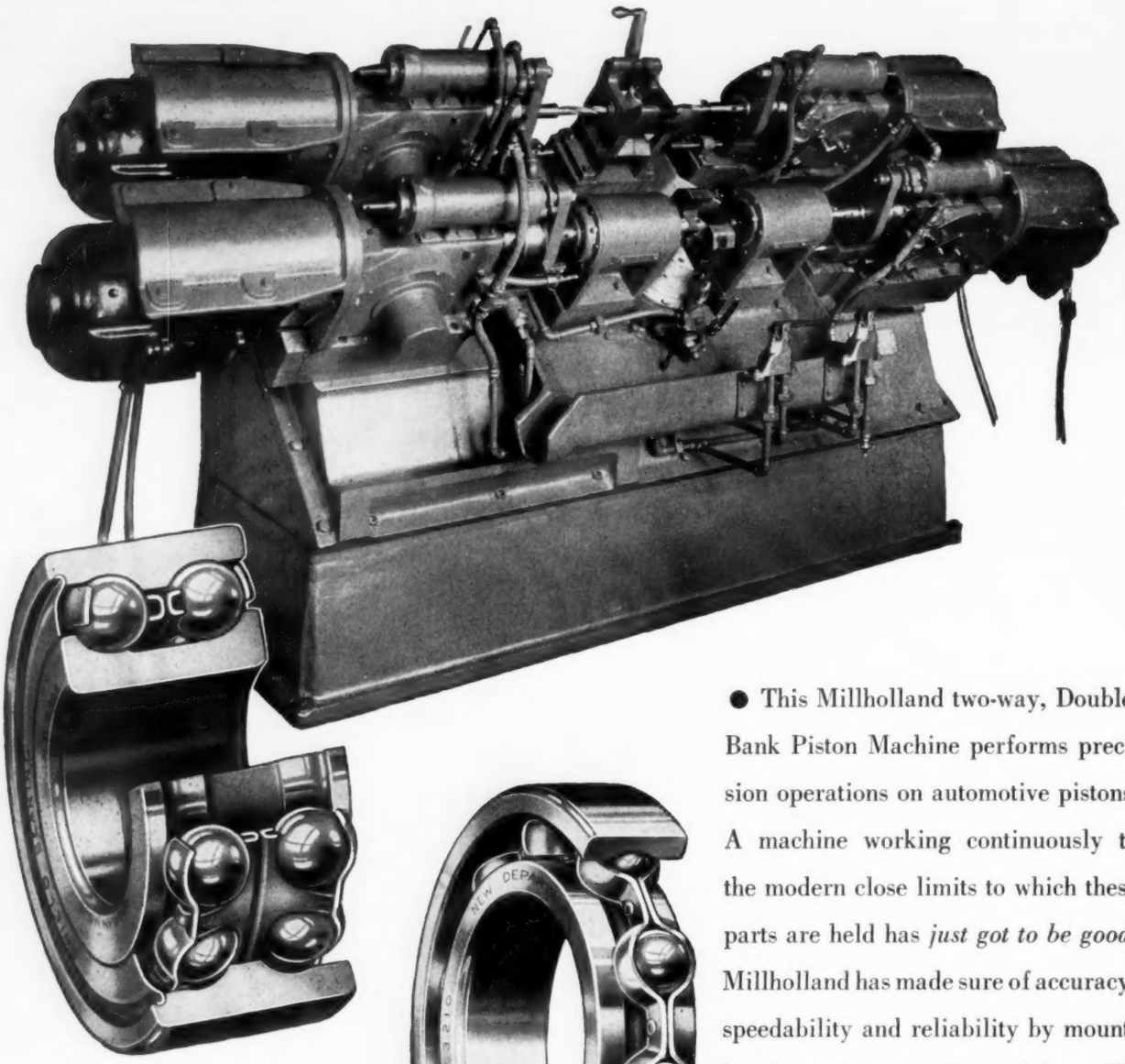
J. M. Sylvester has been appointed assistant general manager of the Bethlehem plant. He was formerly in charge of the Lehigh division of this plant. Mr. Sylvester attended the United States Naval academy at Annapolis, and after two years in the navy entered the employ of Bethlehem. In 1921 he became superintendent of forges and foundries, and in 1924 superintendent of the Lehigh division.

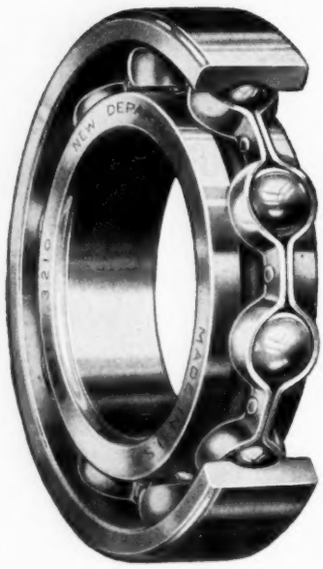
V. J. Pazzetti has been named superintendent of the Saucon division, having been formerly superintendent of open hearth No. 2 in this division. Mr. Pazzetti attended Lehigh university. He has been with Bethlehem for 23 years, and has occupied the positions of melter at Saucon open hearth, night-turn assistant superintendent, day-turn assistant superintendent, and superintendent of No. 2 open hearth.

J. C. MacNeill, formerly assistant superintendent of open hearth No. 2, has been made superintendent of open hearths, Saucon division, Bethlehem plant. Mr. MacNeill has been with the company for 20 years, and was educated at Yale university, being graduated from there in 1915.

A PRODUCTION MACHINE *must be—*

Accurate — Fast — Reliable





THE BEARINGS: The Angular Contact Double Row Ball Bearing, originated and developed by New Departure, gives closer shaft location under combined loads from either direction than any other unit bearing. All types of New Departure bearings are *forged* from the world's finest steel.

● This Millholland two-way, Double-Bank Piston Machine performs precision operations on automotive pistons. A machine working continuously to the modern close limits to which these parts are held has *just got to be good.* Millholland has made sure of accuracy, speedability and reliability by mounting the various spindles and the quills through which they reciprocate on 16 New Departure Ball Bearings. . . . The New Departure Mfg. Company, Bristol, Connecticut. Branches located at Detroit, Chicago and San Francisco.

Nothing Rolls like a Ball *No Other Form so Strong*

NEW DEPARTURE BALL BEARINGS

PEDIGREED MATERIALS • CREATIVE ENGINEERING • PRECISION MANUFACTURING 2385

Mirrors of Motordom

DETROIT

A VERY deep shade of blue—but from blueprints only—has the upper hand in Detroit today. From the current rates on automobile production the industry has no cause for a long wail, but ream upon ream of newly-distributed blueprint paper has the machine tool and die trades perking up.

Just since April 15 has the 1937 revamping program in plants here begun to unfold itself. True, even since March some advance preparation work has been going on, and it still remains for the coming sixty to ninety days to witness all of the expenditures come forth from the motor makers, yet many are now plunging into their plans to a substantial degree.

By last week, the various Chrysler Corp. divisions and such as the Fisher Body and Ternstedt Mfg. divisions of General Motors were making news. These, more than others, were noticeably prominent in estimating quarters for new machinery, new dies, and general re-equipping.

To detail some of this stir, Chrysler is proceeding with at least one large plant rehabilitation. The factory it bought from the LaSalle division of General Motors, popularly referred to as the "West End" plant, is now being refurnished for a large sheet metal stamping works.

Chrysler To Do Body Work

This old LaSalle plant was purchased by Chrysler about two years back, but in the interim was used for little more than storage space, plus some activity on certain of the company's export business.

But last Tuesday bids were being closed on items like seven 15-ton cranes and the following day tenders were being gathered on a large lot of press room machinery. One of the Willys-Overland sheet metal men, prominently known in the industry, has been engaged to head the new Chrysler division.

Because such heavy press equipment is going in there and because the stir was so pronounced, well-versed opinion in Detroit saw the indication that certain Chrysler body work would be taken in closer under the wing of headquarters in Detroit.

The heavy nature of the cranes being bought was also mute evidence that no light stampings will be made at the West End plant. Thus, either Chrysler will pull in certain of its long-haul parts that it buys on the outside, or is optimistically inclined toward the 1937 market.

If the latter is true, obviously it will need the increased space and would let outside stamping sources unchanged. But, if the former is true, perhaps certain work that such as Budd or Heintz Mfg., both of Philadelphia, have may be affected.

New Machinery Purchased

These firms have always had a share in Chrysler work, in addition of course to Chrysler's own stamping facilities—of which the Dodge shop is outstanding in the industry—plus the usual flow of Chrysler subcontracts let out chiefly in the Detroit, Cleveland and Chicago areas. In this connection it is interesting to note that some Budd departments were recently moved from the Philadelphia plant into the Detroit shops of that concern.

The other piece of Chrysler retooling news centers at the company's East Jefferson division. Considerable inquiry for that plant has been going on for the last month to six weeks, and last week it came to light that heavy expenditures have just been made there for a wide list of new machinery.

The purchase orders are recent enough so that the equipment will not be delivered until into June. It seems definitely established that the East Jefferson plant buying centers around a program on two new motors for the Chrysler lines.

A further Chrysler manifestation of expansion is at Marysville, Mich., where the treasury purse strings are also being unloosened. The old Wills St. Claire plant there is being reconditioned, a 50 x 300-foot addition is going up and several hundred thousand dollars will be spent.

Hoods, gas tank shields, some fenders, splash shields, and other sheet metal parts will be made at Marysville, but which will be primarily a parts' service division. Another item to be "produced" is skilled labor, because Chrysler is lodging some of its apprentices there, though many still report at the division set aside recently in the Dodge plant.

The final O.K. has been put on design of some 1937 Chrysler parts which are eventually to be delegated to outside shops after the dies are made. Supplementing the issue of prints on many of the small Chrysler stampings, which were noted here two weeks ago, subsequent plans are in the hands of tool and die makers on larger items for prompt estimating, such as the fenders last week.

Large Mystery Plant Equipped

General Motors is another also doing much squaring away for 1937. Without benefit of publicity it is spending well over a few millions for the season ahead. Strangely, though, the largest item currently in the new plant docket of General Motors is, and yet it isn't a mystery.

Ever since the big Grand Rapids plant of Fisher Body got started and the Syracuse, N. Y., plant of subsidiary Brown-Lipe-Chapin was reopened, Detroit has been hearing much of another widening out. But what this new division is to manufacture and where it is to be located constitutes the mystery angle.

This is the more complicated by the extensive spending General Motors purchasing department has now completed for this plant. A wide and representative list of machine tools and other equipment has been bought, yet each purchase order carries the novel clause that "such and

Mirrors of Motordom

such piece of equipment must be on the floor in Detroit, June 1."

No amount of prying will dislodge the information where deliveries are to be made in Detroit. Clearly the buying, all for new machinery and without doubt genuinely motivated, is not against other General Motors retooling programs under way.

These, such as at Flint on the new Chevrolet motor, or at Saginaw (where 100 gear cutters were bought recently) or for Grand Rapids and its giant presses, or for the Gear & Axle plant buying, clearly designate points of delivery.

So, when a responsible buyer starts churning up the market with purchases and goes so far to name a deadline on shipment but won't name where it wants the work sent, all manner of conjecture gets a boost. To sift down the stories current in Detroit today, in the final analysis it seems an odds-on wager that one of two major developments are in mind.

The first would center around General Motors making its own automatic transmission devices, since this mechanical change is strongly indicated by the industry at large for 1937 adoption.

Diesel Engines Again

The second is on the subject of diesel passenger car engines, which are a ripe subject in engineering departments of General Motors. The company for some time has had competent engineering minds reporting directly to Mr. Knudsen, executive vice president, on the matter. This is entirely independent of the work proceeding at the Electro-Motive division in Chicago, devoted to train and bus diesels.

At all events, such deductions are all the more substantiated when one scans the other General Motors divisions to find that the Grand Rapids expansion rules out further stamping capacity for the time being, and that the Flint, Saginaw, and the various Detroit divisions seem adequately balanced for the manufacture of their respective 1937 parts.

The coming month will tell the story and further reveal General Motors' hand on what is in store. Meanwhile, a heavy list of machinery ranging from heavy-duty equipment down to precision gages is being made against this more or less mysterious delivery.

Ternstedt, always construed as the automotive hardware-manufacturing subsidiary of General Motors, will take in a wider range of products for next year. Some of the Fisher Fleetwood output will be placed under Ternstedt management, also part of the product work tributary to A. C. Spark Plug.

Allocation of orders for new tools and dies was prominent from Ternstedt last week, which along with Fisher Body placed business of this nature that amounted to better than several hundred thousand dollars. On two days last week tool and die orders placed by these two concerns were at a $50,000-per day clip.

One novel piece of grinding equipment has been purchased by Fisher—a metal grinder set up to continuously surface a steel sheet 55 inches wide by 80 inches long. It will be installed in the new Grand Rapids division.

In this connection, Ford is interested in a similar grinder, which may be specified to go to 59 inches wide—no better indicator that the all-steel top is looked on kindly by Dearborn.

So much for retooling, now in its busy season and a subject that could take a few volumes. Now that April has gone to posterity, it looks like automobile assemblies then were the fifth heaviest month in the industry's history.

All reports since last Friday are not in yet from the outlying assembly plants, from assemblies destined for export, etc., but April probably topped 500,000 jobs. This is the heaviest since June, 1929. Only March, April, May and June of 1929 saw more cars made than April.

In part buoyed by this sensational performance, the industry has lost no heart as it plunges into May. Because projected assemblies by each maker for the month are at least as good, May looks like another hummer.

From present plans, Chevrolet will make slightly more cars this month than last and may reach 135,000 jobs. Ford looks to follow closely to what was the April schedule of 120,000. The Plymouth setup for May is for 55,000-60,000, also on the line with April.

The slate in other production departments lines up Dodge at 40,000; Olds, 30,000; Pontiac, 19,000; Buick, 17,000; Hudson-Terraplane 16,000; and Packard, 7000—all of course tentative at this writing, yet not likely to be materially scaled down judging from the exuberant optimism in Detroit today.

Last week, mostly April but partly May, saw Chevrolet still leading in assemblies at 32,750 jobs. Some Chevrolet parts plants are working 54 hours weekly because a full six days weekly are needed to keep finished car assemblies up. Last week Lakey Foundry & Machine Co. started on a new release of 250 cylinder heads daily for Chevrolet, which are being shipped to Warner Gear Co. for machining.

Ford Pistons of Steel

Ford made some 30,500 models through last week, counting, as in Chevrolet's case, all district assembly plants. About two weeks ago Ford initiated a new car price change on a delivered basis. The f.o.b. Detroit price was not revised, but to more nearly conform to freight and assembly plant costs, delivered prices for some districts were hiked from $2.75 to $10 per car.

A minor change is coming through now on some of the Ford carburetors, the new unit part being designated as No. 67. Without any major change, it represents a few slight modifications in that the part is stronger. The fuel pump has not been changed.

Ford is also sending through more models with steel pistons; in fact, the entire V-8 output for Michigan is so equipped. As will be recalled, all of the Lincoln-Zephyrs have steel pistons, and on the V-8 their use has been increasing.

Plymouth had 14,000 assemblies to its credit for last week, and Dodge

Automobile Production

Passenger Cars and Trucks—U. S. Only
By Department of Commerce

	1934	1935	1936
Jan.	155,666	292,785	367,252
Feb.	230,256	335,667	290,964
Mar.	338,434	429,793	424,571
3 mo.	724,356	1,058,245	1,082,787
Apr.	352,975	477,691	.....
May	330,455	364,662	.....
June	306,477	361,248	.....
July	264,933	336,985	.....
Aug.	234,811	239,994	.....
Sept.	170,007	89,804	.....
Oct.	131,991	275,024	.....
Nov.	83,482	398,039	.....
Dec.	153,624	407,804	.....
Year	2,753,111	4,009,496	.....

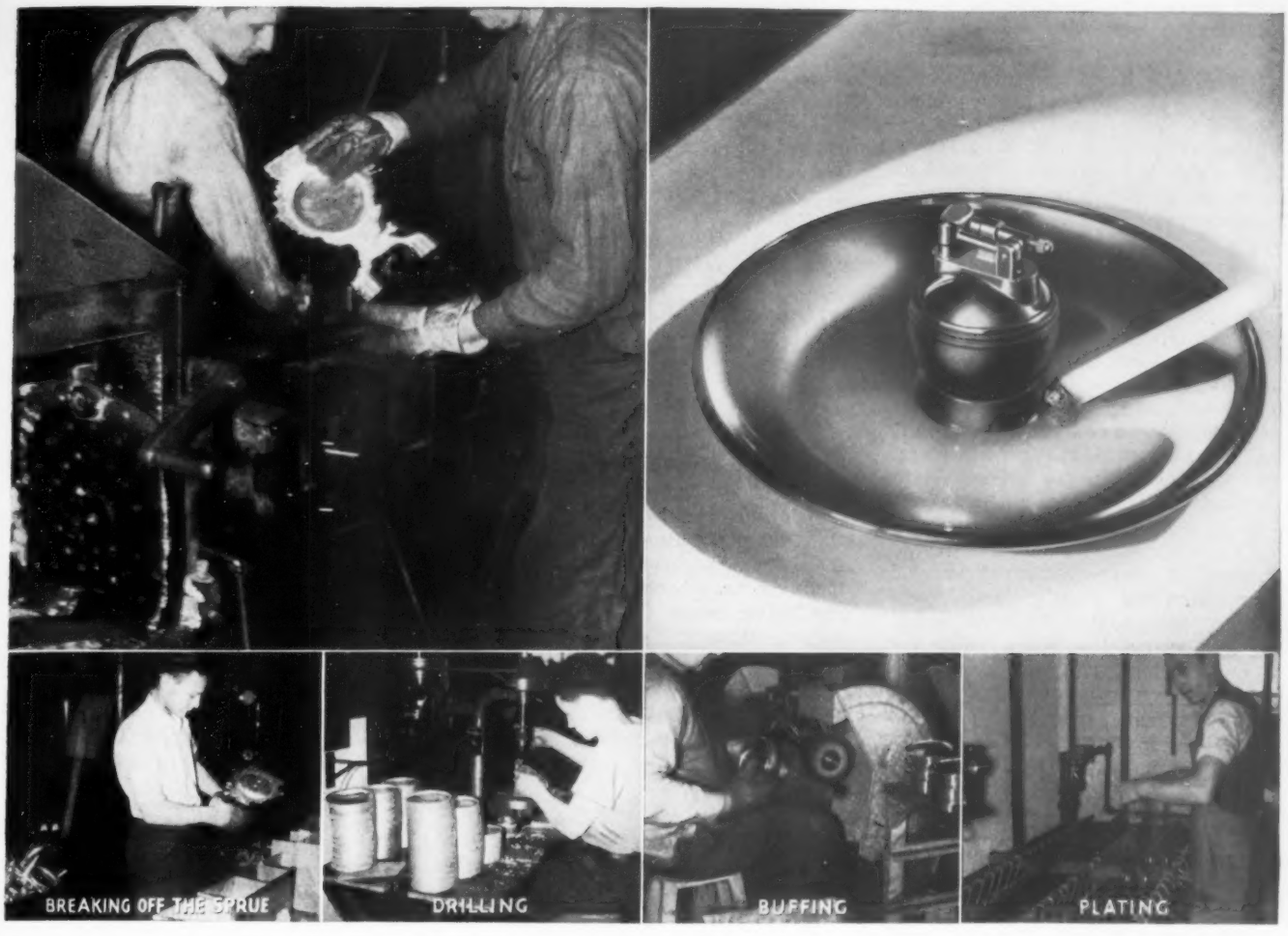
*Estimated.

Estimated by *Cram's Reports*

Week ended:

April 4	108,426
April 11	112,818
April 18	119,834
April 25	120,519
May 2	118,764

HORSE HEAD SPECIAL (99.99+% UNIFORM QUALITY) ZINC



ASH TRAY OR END-PLATE

—make it a ZINC Alloy Die Casting

In considering production methods for your new parts, can you see possibilities from their similarity with other parts? The production pictures shown above are of an ash-tray. Considered more broadly, it's a dish—turned upside down with slight variations it might be a cover, an end-plate or any one of a dozen parts. There were several obvious methods of manufacturing this part; but when costs, ease of finishing and appearance were considered it went to a ZINC Alloy Die Casting.

In our publication, "The Alloy Pot," we try to keep abreast of the rapid developments in this industry. We will gladly place your name on our mailing list to receive the literature on this subject if you so desire.

THE NEW JERSEY ZINC COMPANY

160 Front Street — New Jersey Zinc — **New York City**

was still in fourth place with demand dictating an assembly total for the week of 9175 jobs. Also on the basis of last week's record, finds Olds with 6350 assemblies, Pontiac at 5075, Buick with 4600, Hudson close to 3500, and Packard at 1800.

The remainder of motordom's production was relatively unchanged from the week preceding. One exception, however, was Willys-Overland, which is increasing output, last week made 1000 jobs, and is in the blueprint stage on a complete new series projected for late this year.

Detroit was interested in two pieces of news last week affecting some important real estate here. One was the purchase by the Minnesota Mining & Machinery Co., St. Paul, of the Picquette avenue, Detroit, plant of Studebaker, near Grand River boulevard and Woodward, that last was used for making the Rockne. The Minnesota company will start making automotive equipment about July 1.

The other news concerned Hupp, subject of much conversation and speculation of late. Some have guessed that nearby Packard would eventually use the Hupp plant for manufacturing, and there have been guesses among others that Chrysler would move in.

An option on the Hupp plant, at least for the engineering department, however has been taken by the Goodyear Tire & Rubber Co., Akron, O., presumably a move not only to enter the Detroit district physically, but also to dodge a hot labor market at Akron. However, it's no certainty that Goodyear will close the option. The Hupp management, still determined on reopening thinks that likelihood favorable. Offer of a contemplated stock issue will determine Hupp's future operations.

Good Summer Seen for Machine Tool Industry

A steady upward business swing was reported in progress in virtually every section of the country by district sales heads assembled in their annual sales conference at the Warner & Swasey Co., Cleveland, manufacturer of turret lathes.

Reporting on all parts of the United States, as well as Canada, the two score sales representatives agreed that business as a whole is good, with the outlook for some months to come promising, said Clifford S. Stilwell, vice president in charge of sales.

Substantial progress already has been made and will continue in heavy industries such as steel, road machinery, material handling, oil equipment and heavy machinery. Some buying by railroads was reported for the first time in several years.

At the same time, the automotive, household appliance, aviation, brass, hardware, and other semi-consumer industries were also reported to be increasing production.

"Our own business," said Mr. Stilwell, "reflects the reports we have received from our field representatives. Although it is probable that the machine tool industry will experience somewhat of a recession during the summer months, it now seems likely that the falling off will not occur until later than has been anticipated. At present it appears probable that the momentum of the present upswing will continue to carry the industry at fairly high levels through the months of July and August."

Died:

JOHN B. BOESEL, 60, for the past five years superintendent of the Dornbirer Machine Tool Co., Cleveland, in that city, April 24. He formerly had been connected with the Bailey Meter Co. and the Cleveland Automatic Machine Co.

♦ ♦ ♦

Clifton Wharton Jr., formerly manager of the New York office of National Tube Co., in Blooming Grove, Pa., April 29.

♦ ♦ ♦

Gustav Sittman, 72, inventor of an automatic screw machine, in Woodhaven, Queens, New York, April 24.

♦ ♦ ♦

Robert McCrimmon, an open-hearth foreman at the Homestead works of Carnegie-Illinois Steel Corp. for the past 22 years, at Pittsburgh, April 25.

♦ ♦ ♦

Russell J. Atkinson, 63, president of the Metropolitan Hardware association, New York, and one time president of the National Retail Hardware association, in Brooklyn, N. Y., April 28.

♦ ♦ ♦

George Naismith, 78, a furnace building contractor for the past 40 years, and prominently identified with the construction of several of the large steel companies, at Aspinwall, Pa., April 28.

♦ ♦ ♦

Henry L. Austin, assistant to Edward R. Stettinius Jr., chairman of finance committee, United States Steel Corp., New York, at his home in Summit, N. J., May 1. Mr. Austin started with a subsidiary of the Steel corporation in 1897. He served as comptroller of the Corporation from 1931 to Jan. 1, 1936, when he was made assistant to Mr. Stettinius.

♦ ♦ ♦

Claude Bethel, 44, manager of the railway engineers' department of the Westinghouse Electric & Mfg. Co., East Pittsburgh, Pa., at Wilkinsburg, Pa., April 27. He had been in various Westinghouse engineering departments for the past 17 years.

♦ ♦ ♦

Allan Cunningham, 54, founder and president Allan Cunningham Co., manufacturer of deck machinery and marine equipment, at Seattle, April 23. Mr. Cunningham was widely known for his development of electrically-operated and controlled devices.

♦ ♦ ♦

Albert W. Adt, 72, for 15 years president of a tobacco machinery manufacturing company, which his father founded in 1865, in Baltimore, April 26. He was organizer and first president of the Export Managers club, now the Foreign Trade club, of that city.

♦ ♦ ♦

Otto Horix, 63, president, Horix Mfg. Co., Pittsburgh, maker of food packing machinery, in Pittsburgh, April 30. He formerly had been general sales manager of the Bishop & Babcock Co., Cleveland, and later president and general manager of the McKenna Brass & Mfg. Co., Pittsburgh.

♦ ♦ ♦

George Cooling, 75, founder and president, Ace Foundry & Engineering Co., Jersey City, N. J., in Irvington, N. J., April 25. He had been affiliated with the foundry industry almost 50 years. Prior to his formation of the Ace company four years ago, he had been foundry foreman for the Eureka Fire Hose Co., which occupied the premises now owned by Ace. He had been associated with the Eureka company for 23 years, or until it went out of business.

♦ ♦ ♦

F. S. Wheeler, 74, chairman of the board, American Can Co., New York, in that city, April 24. Prior to his affiliation with American Can in 1901, at the time of its organization, Mr. Wheeler had been affiliated with the iron and steel industry for a number of years. Graduating from Northwestern university, Evanston, Ill., he became bookkeeper at the Chapin iron mine in Michigan, later becoming secretary of the Calumet Iron & Steel Co. In 1894 he became secretary and treasurer of the Great Western Tin Plate Co., and when the American Tin Plate Co. was organized in 1898, Mr. Wheeler became its treasurer, remaining in that office after the company's consolidation with three other firms and until the organization of the United States Steel Corp. in 1901. In that year he became treasurer of the newly-organized American Can Co. and remained one of its executives until his death.

WINDOWS OF WASHINGTON

WASHINGTON

WHEN the founding fathers drafted the constitution they were explicit on the point that all tax and revenue measures must originate in the house of representatives. This was supposed to be a safeguard for the peepul. Senators, apportioned evenly among the states, might succumb to the influence of the aristocrats of that day, but representatives, chosen on the basis of population, would guard the common man's rights.

But this viewpoint has been dribbling away over the years, and touched a new low last week when the house passed the tax bill best known for its effort to hit at undistributed profits of corporations and thus function as a phase of the share-the-wealth program. The bill itself was not drafted by the ways and means committee in the first instance, but by the administration's tax experts. Something like that, to be sure, has been done even in Republican administrations.

Few Voted Understandingly

For this measure, probably the most far-reaching of its kind in a century, only 16 hours was allotted for debate on the floor of the house. During this debate, fewer than 50 of the 435 members of the house were frequently in their seats. Many members frankly conceded they had little conception of the provisions of the measure, some of which were expressed in algebraic equations. The final vote, 267 for and 92 against, was almost entirely a party vote.

So the bill now goes to the senate. Actually, the senate finance committee has been holding secret, executive sessions on it for some time, in an effort to ascertain exactly what is its intent. Since the senate rules differ from those of the house, it is difficult to forecast just how long the open hearings on the bill will run, to what extent debate on the floor of the senate will be restricted, and what the conference between the two houses will bring forth.

Nevertheless, it seems a safe bet that the administration will get substantially the tax measure it has proposed, and that it will be ready to go to the White House early in June. Many speak of adjournment by June 15—just after the Republican convention. Then the depression will be over for tax experts, because those who have already tried to interpret the house version have been baffled as never before in their experience.

Denies Business Insurance

One of the strong speeches made in the house against the bill last week, of which there were many, was by Representative Snell of New York, minority leader. He said:

"The avowed purpose of this revenue bill is to prevent business organizations, large or small, from laying up surpluses. Or in other words, the proponents are opposed to a business having a life insurance policy to carry it through the hard times, the same as is done by nearly every provident man when he takes out a life insurance policy to protect his family in case of sickness or death.

"Surplus in business is just a paid-up life insurance policy to protect the business in times of distress. I know from sad personal experience that if it had not been for the surpluses well-managed businesses had laid aside in former good years the depression would have been even worse; dividends, more needed than ever, would have been less, and unemployment much greater.

"Let me suggest that if we are really trying to do something which will promote the welfare of the people of this country and of their federal government, such revolutionary schemes of taxation as the present bill ought not to be railroaded through congress under the pretext of an emergency.

"They ought to be presented to a nonpartisan committee which would be given time to study the proposals from a nonpolitical point of view and to determine what the effect of such proposals will be. * * * * Let us stop this continuous substitution of uncertainty for certainty. Let us not pass a tax bill we know will not become law; but just hope the senate will make a real bill out of it before it goes to the President."

Representative Treadway of Massachusetts, ranking minority member of the ways and means committee, who has seen many tax bills go through the mill, also struck at the bill. He said:

"I am absolutely opposed to increasing the present tax burden by any kind of a tax bill until the administration's wild orgy of expenditure has been stopped. Every dollar of unnecessary expenditure saved means a dollar of new taxes avoided.

"It is not giving the taxpayers of the country a square deal to keep piling on new taxes to fill the pockets of the administration's spendthrifts and boondogglers. If waste and extravagance were eliminated present taxes doubtless would be sufficient to carry the load."

ANY OBJECTIONS TO BILLS FAST BECOMING "COERCION"

The steering committee of members of the house who are co-operating to expedite the consideration and passage of the Robinson-Patman bill, to regulate price discrimination, claims to have in its possession evidence showing that at least some of the larger interests opposing the bill are coercing their employes into protesting against its passage.

The steel industry has a stake in this bill because at the moment it does contain basing point provisions, and regardless of any promises that may have been made to take this feature out of the bill, it is still there and until it is out the bill is of particular interest to the steel industry.

Of course, there is a very general feeling in most quarters here, whether or not they favor the bill, that it may not become law; but certainly if it should, it will be very materially changed and amended.

In connection with this informa-

tion which the steering committee claims to have, it is seeing to it that members of both houses of congress are put in possession of such information as is available.

"The proposed legislation," says the steering committee, "would not deprive large corporations of a single right or privilege which they are entitled to enjoy. It would, however, require that the independent merchant be given the same treatment, under the same conditions extended to his competitor."

GREEN URGES LABOR TO REMAIN NONPARTISAN

A further difference of opinion came into the open last week between William Green, president of the A. F. of L., and John L. Lewis, head of the United Mine Workers, in connection with politics and the labor unions.

The industry may recall having read recently that Mr. Lewis and Maj. George L. Berry had formed a labor league to re-elect the President. Mr. Green now has sent a communication to all of the affiliates of the federation, calling their attention to the fact that that body has always been nonpolitical and requesting that it remain so.

"The training and experience of labor," said Mr. Green, "and the lessons it has learned all lead to the conclusion that the highest and best interests of labor will be served through a strict and close adherence to the traditional nonpartisan political policy of the American Federation of Labor."

Mr. Green and Mr. Lewis already are at loggerheads over the organization of labor, the former adhering to the craft method and the latter beginning to fight for the industrial or vertical type. The administration has patently favored the Lewis method, and Mr. Lewis appears closer politically to the administration than Mr. Green.

FOR FOREIGN TRADE BOARD

Senator Sheppard of Texas has introduced a bill in the upper house to create a federal board of foreign trade and commercial policy. The bill provides for representation on this board from the various government departments.

It also provides that it shall be the duty of the board to co-ordinate the foreign trade and commercial policies of the government with a view to centralizing in one agency supervision of all government activities affecting import and export trade and to act in an advisory capacity to the President in connection with matters relating to foreign trade and commercial policies.

The bill has been referred to the senate committee on foreign relations.

MACHINE TOOL BUILDERS' SHOW WINS AWARD

For its vision and courage in staging the machine tool exposition in Cleveland last September the National Machine Tool Builders' association, of Cleveland, has won the award of the American Trade Executives association.

In making the award last week, Secretary of Commerce Roper stressed the helpful work of the Machine Tool association to related industries and to the general public in improving the design and general efficiency of the master tools of industry. Herman H. Lind is secretary of the association.

Herman H. Lind

Secretary Roper was chairman of the award committee, which reviewed trade association achievements for 1933, 1934 and 1935. Also on the committee were Thomas W. Watson, of International Business Machines; Arthur Whiteside, of Dun & Bradstreet; Dr. Walter Dill Scott, of Northwestern university; and Merle Thorpe, editor of *Nation's Business*.

An honorable mention certificate was granted to the American Institute of Steel Construction, of which V. G. Iden is secretary, and to the Institute of Scrap Iron and Steel Inc., of which Benjamin H. Schwartz is director general.

ROPER LAYS DOWN PROGRAM FOR SPEEDING RE-EMPLOYMENT

Business should survey its own needs and its own conditions from the viewpoint of employing as many persons as current improvements and future programs demand, Secretary of Commerce Roper said speaking on "Increasing Employment and Production," before the twenty-fourth annual meeting of the United States chamber of commerce last week.

The secretary told the business men also that they should stimulate the durable goods industries by early action that will provide for capital goods and machinery replacements due to obsolescence, depreciation, and other causes.

Mr. Roper suggested that business should form industrial committees to study in a comprehensive way technological unemployment and methods for speeding up the transfer into other fields of earning capacity of workers replaced by machines.

It was the contention of the secretary, also, that business should launch more aggressive endeavors to expand our foreign trade all along the line, and especially in co-operation with the administration's reciprocal trade agreements.

"Business should make intensive research study," he said, "of the relationships that should be maintained with respect to production, wages and hours of labor and the necessary methods and mechanics to be utilized in keeping this balanced relationship."

Many Industries Are Full

Mr. Roper said that a fundamental consideration of the unemployment situation "must be how private enterprise can put more people to work. There can be no escape from this, for if it is not the responsibility of private enterprise to employ the millions of people now out of work, then it becomes the responsibility of private charity, and of local, state and the national government to care for them until gainful work is secured.

"Many industries are to be complimented upon the gains which have been registered, and the advantage which has been taken of the improved economic and social conditions to carry forward constructive programs. Today in some industries there are more people employed than before the depression and further gains are constantly being made. But our efforts must be increased upon all fronts through co-operative study and action. Even though one industry may show highly encouraging gains the sound position of that industry is not assured until national unemployment has been greatly reduced.

"There is no greater assurance for successful and profitable operations in the future, and, thus, for decreased governmental expenditures, than the employment of labor. Therefore, it is the responsibility of all business and industrial enterprise, and not of one particular segment or of the government, to increase its efforts for greater employment."

J. & L. TOW LEAVES

Jones & Laughlin Steel Corp. sent out the Ohio river steamer VESTA in charge of ten barges of steel products on April 21, with an aggregate shipment of several thousand tons for delivery to Memphis and other downriver ports.

Editorial

Does Reducing Costs Mean Less Purchasing Power?

PRESIDENT ROOSEVELT'S address of April 25, delivered at the Jefferson day dinner of the National Democratic club at New York, should be studied closely by every person whose livelihood is derived from industry.

During his many years in public service, Mr. Roosevelt has uttered numerous challenging statements in regard to economic, social and political policies, but it is doubtful whether he has ever advocated a philosophy as fallacious or as potentially dangerous as the one he outlined at New York a week ago Saturday night.

The President was engaged in ridiculing an unnamed individual who had declared that the only way to get full recovery is to lower prices by cheapening the costs of production. To refute this reasoning, Mr. Roosevelt presented the following argument:

> "You can cheapen the costs of industrial production by two methods. One is by the development of new machinery and new technique and by increasing employe efficiency. We do not discourage that. But do not dodge the fact that this means fewer men employed and more men unemployed. The other way . . . . is to establish longer hours for the same pay or to reduce the pay for the same number of hours. If you lengthen hours you will need fewer workers. More men out of work. If you choose lower wages for the same number of hours you cut the dollars in the pay envelope and automatically cut down the purchasing power of the worker himself.
>
> "Reduction of costs of manufacture does not mean more purchasing power and more goods consumed. It means just the opposite."

Problems of Mechanization Should Be Solved But Increasing Costs Is Not the Solution

No one will quarrel with the President's inferences that the problem of adjusting our social and economic structure to the influences of a highly mechanized civilization is important. Nevertheless, he has no justification for stating dogmatically that reducing costs of manufacture means less purchasing power and fewer goods consumed.

Of course, one must remember that in his address, the President naively confided that "they say in Washington that my day is not complete without smashing at least one precedent." If the foregoing gem of economic philosophy constituted his precedent-smashing deed for the day, it certainly was a wow. In 20 words he contradicted the laboriously earned wisdom and experience of this world since the beginning of time.

If President Roosevelt is right, think what a mistake Johannes Gutenberg made when he invented printing from movable type! If the President's philosophy is sound, we would be better off if books and periodicals were written by hand—presumably with quills.

Again, it is a downright shame that Obed Hussey and C. H. McCormick developed reaping machines, because—according to the President—we would be consuming more grain and would have a greater purchasing power with which to buy it, if our rye, wheat, oats and barley were being cut by sickle and scythe.

But the worst blunder of all was the development of steelmaking on a tonnage basis. Had Sir Henry Bessemer and William Kelly known that a President of the United States was going to smash a precedent on April 25, 1936, they never would have argued as to who had prior rights on the invention of the converter. Nor would the Siemens, Martins, Wellmans and others have taken pride in their development of the open hearth. How much better it would be—in the light of the President's philosophy—if we were still taking our metal from Catalan forges!

To Accept President's Philosophy Literally Means Returning to Life of Dark Ages

And what about industry today? Every person who is trying to reduce costs should turn to more "constructive" employment. Perhaps all building of efficient machines and equipment should cease. The millions of persons thus released could man the quills, sickles, forges, etc.

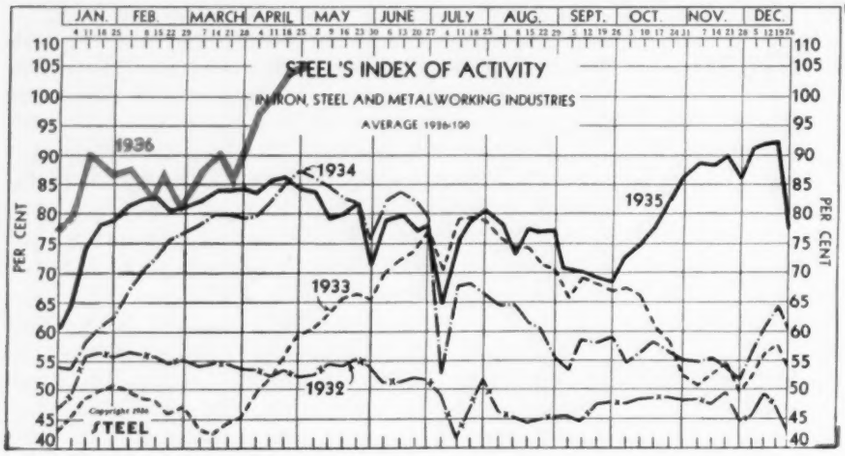
Thus the President's utopia of a machineless, high-cost production age would be realized. There would be more than enough employment to go around. Everything would be fine—except that existence would be reduced to the level of that of the Dark Ages.

Perhaps we take the President too seriously. Possibly his philosophy of April 25 was pointed to smashing a precedent. Certainly he took it lightly, because on Tuesday—three days later—he had completely forgotten what he had said on Saturday.

On Saturday he inferred that reducing costs is a sin. On Tuesday it had become a virtue, because on that day he permitted Secretary Roper to urge industrialists to reduce costs and to "pass on to the consumer the *benefits* of the lower costs of production."

Benefits? How so?

THE BUSINESS TREND



STEEL'S *index of activity in the iron, steel and metalworking industries gained* 0.4 *points to* 103.5 *in the week ending April* 25:

Week ending	1936	1935	1934	1933
Feb. 15	85.9	82.8	72.4	48.3
Feb. 22	81.8	80.5	75.5	46.0
Feb. 29	83.4	81.1	76.8	47.4
Mar. 7	87.7	82.0	78.6	43.4
Mar. 14	89.7	84.0	79.9	42.7
Mar. 21	86.0	84.0	79.7	44.6
Mar. 28	91.2	84.3	79.3	45.2
Apr. 4	96.8	83.4	79.6	49.1
Apr. 11	99.6	85.4	82.2	52.6
Apr. 18	103.1†	86.3	85.0	55.8
Apr. 25	103.5*	84.9	87.5	59.5

†Revised. *Preliminary.

The index charted above is based upon freight car loadings, electric power output, automobile assemblies (estimated by Cram's Reports) and the steelworks operating rate (estimated by STEEL). *Average for* 1926 *equals* 100, *weighted as follows: Steel rate* 40, *and car loadings, power output and auto assemblies each* 20.

Weather, Floods and Prices Cut First Quarter Profit

EARNINGS for steel producers for the first quarter reflect three factors which probably were under-rated at the time their influence was effective.

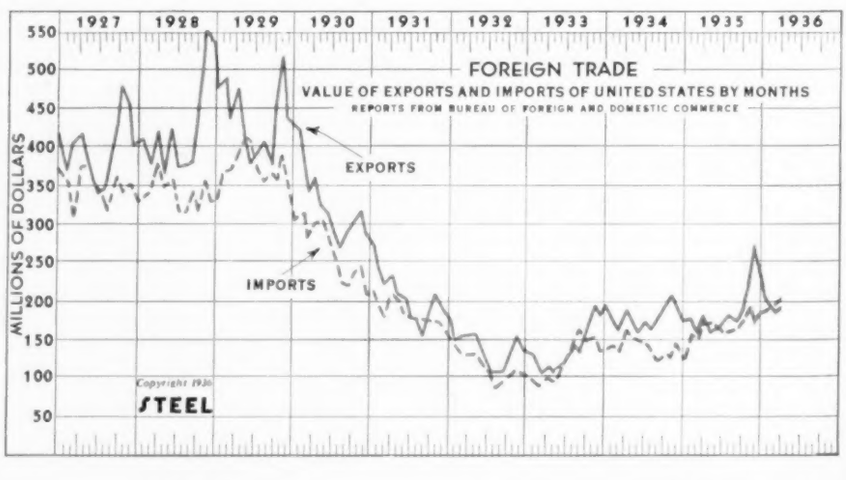
First was the competitive price war which waged throughout the first half of the period. The profit statements show quite clearly that the concessions in quotations in January and February undoubtedly were at least as drastic as was intimated by the market reports in business papers—and possibly more so. Otherwise profits would have been more in line with the volume of production.

A second factor was the extreme cold weather of January and February. A third was the unprecedented high water of mid-March. The play of all three factors was such that many companies made poor or mediocre showings in the first two months and enjoyed very good profits in March. The net result for the quarter, in most cases, was somewhat below expectations.

The second quarter should show a marked improvement from the profit standpoint. April has been a month of high volume, with fairly satisfactory prices. STEEL'S index of activity for the week ending April 25 stands at 103.5, a fractional advance from the previous week. This may prove to be the peak for the current spring cycle. A gentle tapering off seems to be indicated, although strong support for maintaining a good rate of activity for several weeks more is in sight.

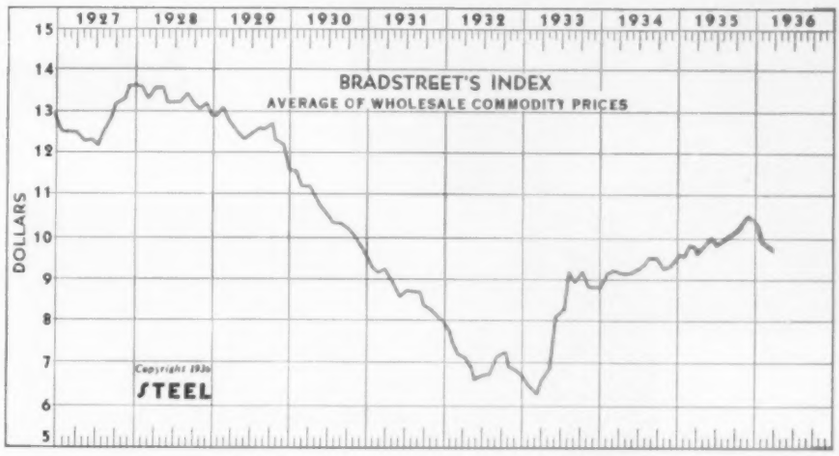
Dollars (000 omitted)

	1936		1935	
	Exports	Imports	Exports	Imports
Jan.	197,950	187,440	176,223	166,993
Feb.	182,630	192,821	162,999	152,491
Mar.	195,336	200,295	185,603	177,279
Apr.	.....	.....	164,350	170,567
May	.....	.....	165,457	170,207
June	.....	.....	170,193	156,756
July	.....	.....	173,371	177,698
Aug.	.....	.....	172,194	169,030
Sept.	.....	.....	198,189	161,653
Oct.	.....	.....	221,215	189,240
Nov.	.....	.....	269,400	168,955
Dec.	.....	.....	223,737	186,648


1927 1928 1929 1930 1931 1932 1933 1934 1935 1936
FOREIGN TRADE
VALUE OF EXPORTS AND IMPORTS OF UNITED STATES BY MONTHS
REPORTS FROM BUREAU OF FOREIGN AND DOMESTIC COMMERCE
EXPORTS
IMPORTS
MILLIONS OF DOLLARS
Copyright 1936 STEEL

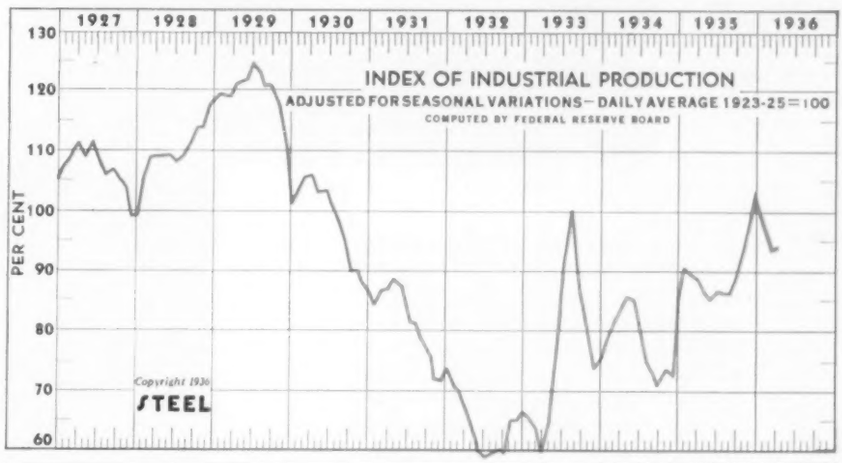
Index of Commodity Prices Continue Downward Trend

	1936	1935	1934	1933
Jan. 1	$10.36	$9.49	$9.01	$6.53
Feb. 1	10.02	9.78	9.26	6.53
Mar. 1	9.92	9.79	9.17	6.54
Apr. 1	9.85	9.66	9.16	6.98
May 1	.....	9.79	9.14	8.02
June 1	.....	9.90	9.24	8.34
July 1	.....	9.84	9.32	9.01
Aug. 1	.....	9.91	9.48	8.99
Sept. 1	.....	10.00	9.45	9.05
Oct. 1	.....	10.17	9.27	8.84
Nov. 1	.....	10.28	9.29	8.81
Dec. 1	.....	10.40	9.49	8.83


1927 1928 1929 1930 1931 1932 1933 1934 1935 1936
BRADSTREET'S INDEX
AVERAGE OF WHOLESALE COMMODITY PRICES
DOLLARS
15 14 13 12 11 10 9 8 7 6 5
Copyright 1936
STEEL

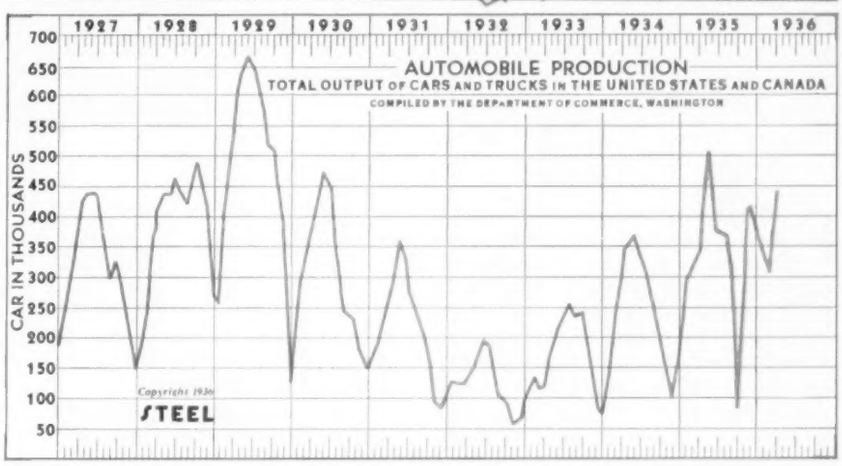
Industrial Production Index Unchanged in March

	1936	1935	1934	1933
January	98	91	78	65
February	94	89	81	64
March	94	88	84	60
April	....	86	85	67
May	....	85	86	77
June	....	86	84	91
July	....	86	75	100
August	....	87	73	91
September	....	89	71	84
October	....	95	73	77
November	....	98	74	73
December	....	104	86	75


1927 1928 1929 1930 1931 1932 1933 1934 1935 1936
INDEX OF INDUSTRIAL PRODUCTION
ADJUSTED FOR SEASONAL VARIATIONS—DAILY AVERAGE 1923-25=100
COMPUTED BY FEDERAL RESERVE BOARD
PER CENT
130 120 110 100 90 80 70 60
Copyright 1936
STEEL

March Automobile Output Registers Sharp Advance

	1936	1935
January	380,554	303,392
February	304,232	353,781
March	442,545	451,768
April	.....	501,814
May	.....	385,364
June	.....	376,993
July	.....	350,054
August	.....	247,686
September	.....	95,127
October	.....	283,337
November	.....	411,535
December	.....	421,579

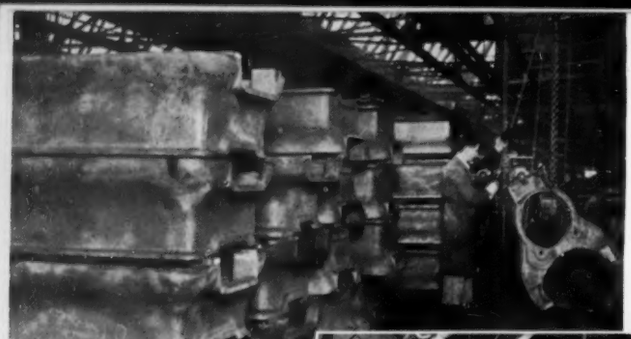

1927 1928 1929 1930 1931 1932 1933 1934 1935 1936
AUTOMOBILE PRODUCTION
TOTAL OUTPUT OF CARS AND TRUCKS IN THE UNITED STATES AND CANADA
COMPILED BY THE DEPARTMENT OF COMMERCE, WASHINGTON
CAR IN THOUSANDS
700 650 600 550 500 450 400 350 300 250 200 150 100 50
Copyright 1936
STEEL

March Building Awards Show Sharp Gain

	Square Feet		
	1936	1935	1934
Jan.	27,053,300	11,245,100	9,568,700
Feb.	20,856,700	9,670,300	8,176,300
Mar.	31,308,100	15,845,300	14,788,900
Apr.	.....	19,981,100	14,207,100
May	.....	22,276,200	14,664,400
June	.....	22,878,800	13,986,500
July	.....	21,565,900	13,250,000
Aug.	.....	21,545,400	14,259,000
Sept.	.....	21,365,700	12,510,300
Oct.	.....	27,775,900	15,098,100
Nov.	.....	24,120,700	12,780,800
Dec.	.....	33,441,900	9,188,700

1927 1928 1929 1930 1931 1932 1933 1934 1935 1936
BUILDING CONSTRUCTION
CONTRACT AWARDS IN 37 STATES
COMPILED BY F. W. DODGE CORP.
MILLIONS OF SQUARE FEET
100 90 80 70 60 50 40 30 20 10
Copyright 1936
STEEL

Material Handling Of Screw



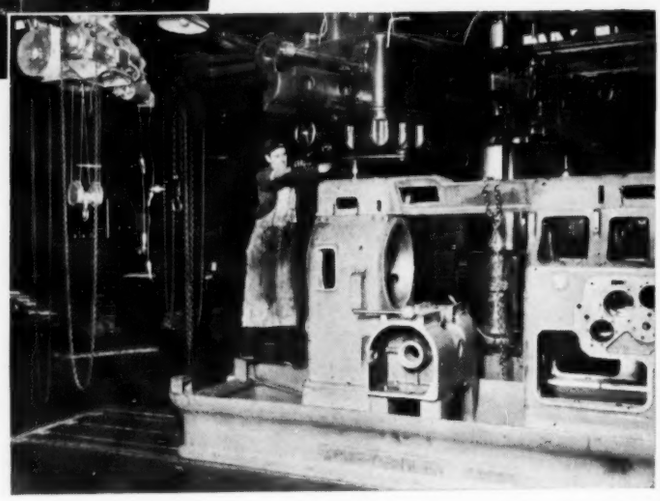


FIG. 1 (upper left)—The starting point in the straight-line production of screw machines. Large cast parts are picked up by the cranes and started down the assembly lines. Fig. 2 (above)—Milling operations on the large castings in the early steps of the assembly line. Fig. 3 (right)—An assembly operation, with machine mounted in radial drill

BY FRED B. JACOBS

PROMINENT among the important factors entering into production costs in any manufacturing plant is that of material handling. Many years ago when practically all manufacturing plants were from two to six floors high, the departmental system of manufacturing was employed exclusively. Thus a representative machine shop had a planing department, a milling department, drilling department, assembly department, etc. Parts which could be handled readily were loaded on trucks for transportation about the shop, while heavy units were moved on skids and rollers. Chain hoists and traveling cranes were used to some extent, but in the majority of factories brute strength was the common motive power.

Straight-line production as we know it today was developed in the automotive industry where it was found that time was saved by ignoring departments as much as possible and placing all types of machine tools in production lines where they were needed. The cost of machine tools in such a layout is high but the savings warrant the investment.

It is not possible to institute out-and-out straight-line production in all manufacturing industries, but a combination of the straight-line and departmental systems can be worked out advantageously. While it is not common to associate straight-line production methods with machine tool manufacture, a combination of the straight-line and departmental methods has been worked out advantageously at the plant of the National Acme Co., Cleveland, manufacturer of automatic screw machines.

Heavy parts such as gear housings, headstocks and pans travel in straight lines from the time they are received until the finished machines are ready for shipment. Such operations as precision grinding, milling, cam cutting, chuck making, heat treating and welding are done in departments organized for the purpose. However, the layout of the shop is such that parts go through these departments to inspection and stock with little backtracking.

The entire problem from start to finish is one of material handling. Machine tool components are heavy units at best and this is especially true of the parts that go into Gridley automatic screw machines. Other parts that are highly finished must be transported about the shop without marring finished surfaces, and various types of special racks and other devices have been introduced with this end in view.

In Fig. 1 is shown the lower end of the production line devoted to the machining of heavy units such as beds, gears cases and spindle carrier housings. These heavy castings are made in a local foundry and delivered on trucks. The truck drives directly into the shop and deposits its load where the parts can be picked up by a traveling crane. This production line is 550 feet long with an overhead

in the Production Machines

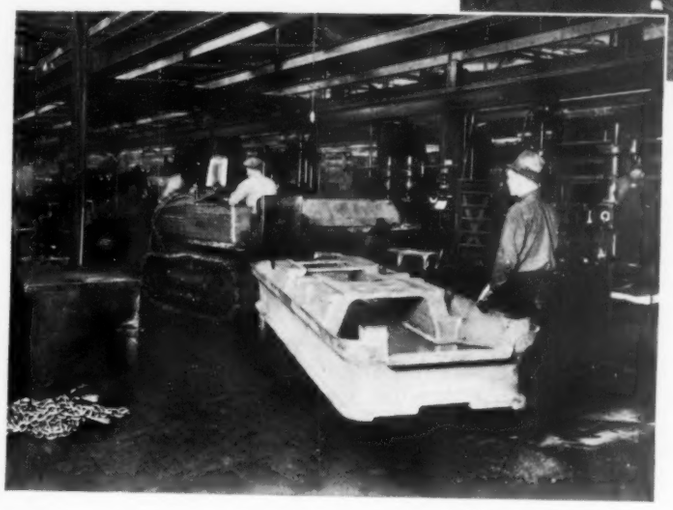


FIG. 4 (left)—After they are machined, the heavy beds are placed on platforms as shown and transported by tractors to the assembly line. Fig. 5 (above)—One section of the 460-foot assembly line. Fig. 6 (upper right)—Completely assembled machines roll off this end of the assembly line and are subjected to tests; then they are hauled by tractors to the shipping dock

crane runway the entire length. It is served by 15 hand operated cranes and several electrically operated hoists. These gradually are taking the place of the hand operated hoists.

Referring again to Fig. 1, the units at the left are machine beds piled in tiers to conserve floor space. As these parts are needed they are handled readily by the hoists. The operator at the right in Fig. 1 has just picked up a stock feed shaft support. Such a part is too heavy and cumbersome to lift by manual labor alone, but with the type of hoist in question one man can handle the load readily.

In Fig. 2 are shown several heavy-duty planer-type milling machines in the line devoted to heavy work. All the parts in position on these machines are handled readily by one or two men. In this line also are planers and horizontal boring mills; in fact, all the equipment necessary to machine the various castings completely. As Fig. 2 shows, this production line is not unduly crowded, and plenty of aisle space is provided. This is necessary in the handling of bulky parts.

After all the machining operations are complete on the various castings which go to make up the machine frame, the castings are set aside near the end of the production line and painted. Several coats of paint and filler must be applied as these machine tools are highly finished. While it is true that a separate painting department is provided for finishing comparatively small units, it would be a waste of time and energy to haul these heavy parts to and from the painting department, so they are set aside and painted as soon as the machine work is complete.

Heavy Members Assembled

The next step is to assemble the components which make up the frame. This is done as shown in Fig. 3. The machine used is a 6-foot radial drill of the latest design and is located at the other end of the production line. This drill is served by both a chain and an electric hoist. Here the machinist locates the various parts, aligns them and bolts the frame members together securely. Thus all the heavy components shown in Fig. 3 traveled in a straight line of 550 feet with no backtracking, the only stop being when the parts were set aside for painting. An excellent idea of the size of these units can be had from the machinist shown at work in Fig. 3. While it is true that the chain hoists previously mentioned can pick up heavy units, these often are transported as shown in Fig. 4. Here a bed is set on a platform provided with six metal legs and a crawler type tractor furnishes the motive power. This arrangement is a great improvement over the old method of putting such a casting on rollers and moving it with a gang of men with crowbars.

In Fig. 5 is shown part of the assembly line. An idea of the size of this department can be had from the fact that it is 460 feet long. It is not uncommon to have from 30 to 50 machines in process of assembly, and testing. After the frame is assembled, as shown in Fig. 3, this unit is taken to the assembly line by means of a crawler-type tractor, and set in a line

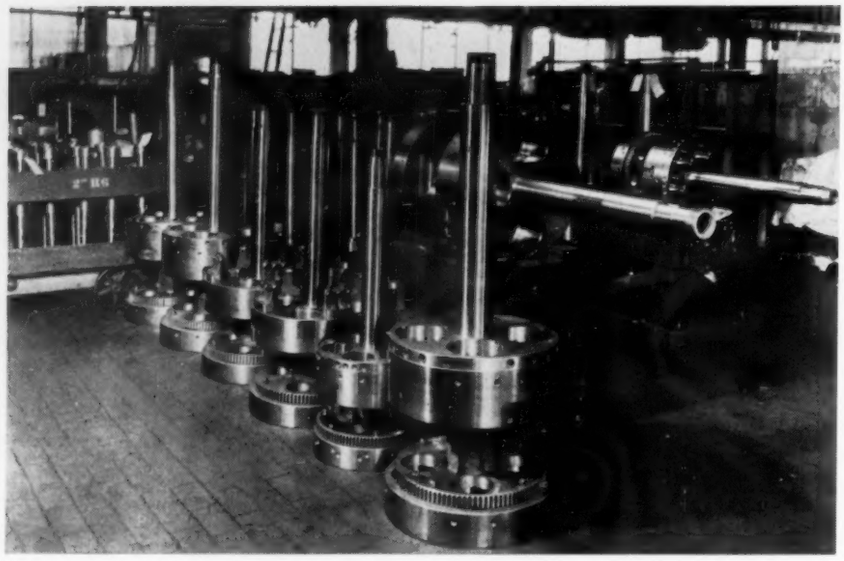


Fig. 7—This view shows spindle carriers and special handling trucks devised to protect them from damage in transporting to the assembly line

with several other machines of like type. After a machine is assembled the tractor again is used to haul it to the location in the assembly line where the first power test is given. From this test the machines go to the final test at the end of the assembly line. Tractors furnish the motive power for hauling the machines as shown in Fig. 6. A sling is put around the machine base and attached to the tractor. After the final test the machines are crated at the lower end of the assembly line, and are hauled to freight cars. The company's railroad siding is located at the side of the building near the end of the assembly line. It will be noted that these heavy units travel through a long production line and a long assembly line with practically no backtracking.

Individual Carriers Required

Special handling appliances must be provided for a number of units. For example, the parts shown on the floor in Fig. 7 are spindle carriers. They are finished accurately by precision grinding and means must be provided to keep them from becoming marred before assembly. In the left background is shown the type of truck rack used for transporting the spindles. Such a truck is easily rolled from place to place by one man.

The spindle carriers and spindles shown in Fig. 7 go to a special department for assembly. A spindle on a truck as shown at the right in Fig. 7 is carried to the assembly department in question where it is picked up by a chain hoist running on a trolley and located on one of the special assembly benches. After the spindle carrier is completely assembled it is again placed on one of the trucks as shown at the right in Fig. 7 and carried to the assembly line. Here it is picked up by a hoist on one of the traveling cranes and put into the machine for which it is intended. The entire assembly line is served by six hand operated traveling cranes, each provided with a chain hoist.

As stated previously, the material handling system at National Acme is necessarily a combination of the straight-line and departmental systems. Some departments can be arranged in straight lines; for example, the department where the spindle carriers are made is representative of this practice. Instead of transporting these comparatively heavy units to the grinding department for finishing, the spindle carrier department has its own grinding machines placed conveniently in the production line. The foregoing applies only to heavy work, but it must be borne in mind that an automatic screw machine has thousands of components and many of these are comparatively small parts. The expression "small part" is a general one, to be sure, but it embraces anything that can be picked up and carried conveniently by hand.

Small Parts Classified

These so-called small parts must pass through the lathe, milling, grinding and heat treating departments. The parts are transported readily in steel tote boxes of which several thousand are in constant use. The raw material may represent small castings, forgings, tubing, bar stock sections and the like. Small castings are unloaded from foundry trucks and stored against release orders for manufacturing. Bar stock sections and tubing are issued on order from the steel stockroom located at one end of the shop close to the railroad siding. In cases where the parts are small enough to load into tote boxes this system is used and the boxes carried to the various manufacturing departments on electric trucks.

These tote boxes filled with semi-finished or finished parts can be stored on the floor until a truck transports them to the next manufacturing department or in cases where all manufacturing operations are complete to the inspection department. From inspection the parts go into stock to be taken out again on orders for assembly.

Parts not for immediate use are stored against assembly in special racks made of iron pipe. Parts too large to store in tote boxes conveniently are placed at the bottom of the racks while three tiers of tote

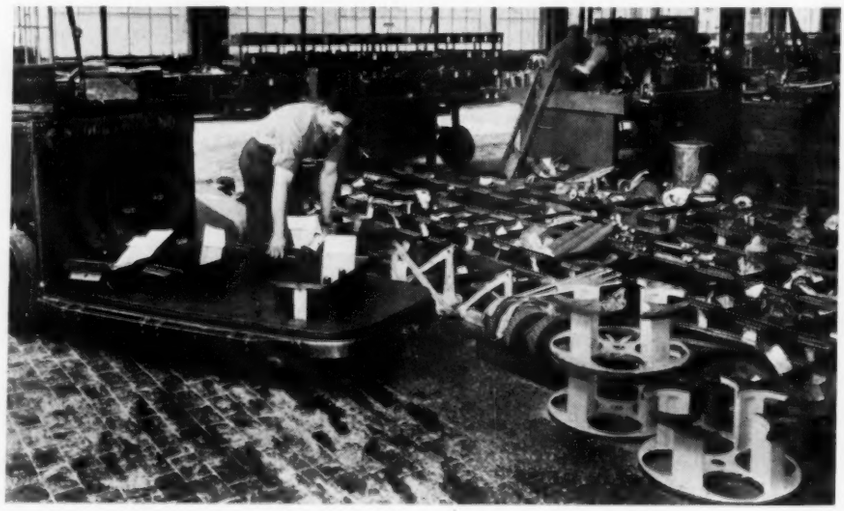


Fig. 8—Small parts are carefully classified and placed in bins at the end of the assembly line where they are easily located when needed

boxes can be accommodated on the shelves. This arrangement conserves floor space and at the same time it affords a practical means for storing the material against assembly in a practical manner so that it can be obtained readily. Thus an assembler or a stock chaser can locate parts by this manner in a fraction of the time that would be necessary in ordering out each individual part from stock which always entails considerable waiting at the stockroom windows.

Plan To Expand Welding Research Organization

Plans to expand its organization for the advancement of welding research have been announced by the Welding Research committee of the Engineering Foundation, of which Prof. Comfort A. Adams of Harvard university is chairman.

A new industrial subcommittee to co-ordinate industrial welding research has been formed under the direction of Col. C. F. Jenks, commanding officer of the Watertown, Mass., arsenal. Seven divisional committees are being organized to work with the subcommittee headed by Colonel Jenks in studies of special fields. J. H. Critchett, vice president of the Union Carbide & Carbon Research Laboratories, New York, has been named chairman of a committee on the welding of low-alloy steels. H. C. Jennison, technical manager of the American Brass Foundry, Waterbury, Conn., will be in charge of a study of copper alloys. J. C. Hodge, chief metallurgist, Babcock & Wilcox Co., Barberton, O., will direct investigations in carbon steel welding. Four other groups, the members of which are now being selected, will deal with cast iron, high-alloy steels, aluminum alloys, and nickel-alloys.

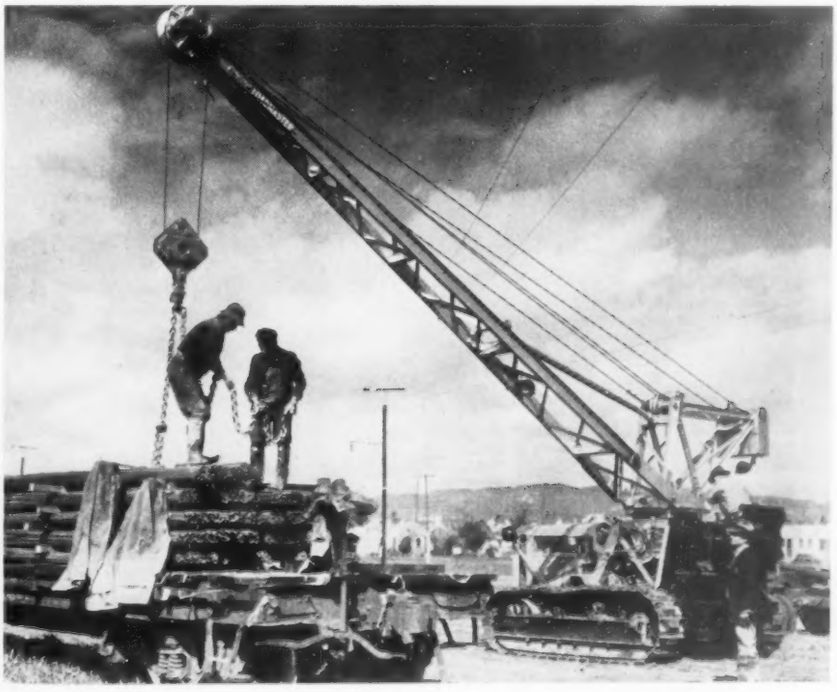
Professor Adams says, "It is the intent of the Committee on Industrial Research, under the chairmanship of Colonel Jenks, to make a thorough canvass of the investigations under way, contemplated, or needed by industry without interfering in any way with investigations of a confidential nature."

Announcement was also made of the formation of three functional subcommittees of the industrial committee. Prof. M. F. Sayre of the department of applied mechanics, Union college, has been named chairman of a method of testing committee; W. D. Halsey, assistant chief engineer, boiler division, Hartford Steam Boiler Inspection & Insurance Company, Hartford, Conn., of a committee on the analysis of weld failures; E. Chapman, vice president of Lukenweld Inc., Coatesville, Pa., of a committee on weld stresses and their causes and effects.

In addition to the above, a subcommittee on fundamental research is guiding 60 investigations in various universities. Many more researches are going forward in industrial and federal laboratories.

Members of the main Welding Research committee, in addition to Professor Adams, Colonel Jenks, Mr. Critchett, Mr. Hobart, and Mr. Spraragen are: Frederick T. Llewellyn, research engineer of the United States Steel Corp.; John J. Crowe, engineer-in-charge of apparatus research and development department of Air Reduction Co.; David S. Jacobus, advisory engineer of the Babcock & Wilcox Co.

Loading Crane Becomes Footloose



A HIGH degree of flexibility is demonstrated by this Bucyrus-Erie loadmaster crane mounted on a Caterpillar diesel RD7. It is owned by the United States engineers, Los Angeles, and here is unloading steel for use in concreting the upper Balloma Creek channel near Culver City, Calif.

Book an Aid in Finding Cost of Conveyor Belts

For anyone interested in maintaining a running record of conveyor performance as a means of determining actual belt cost, the B. F. Goodrich Co., Akron, O., has recently made available a book titled "Cost Finding Record Book for Conveyor Belts." It contains 11 belt and conveyor record sheets. This record form is based upon the long experience of the manufacturer in this field and the suggestions of leading conveyor engineers and users. It can be maintained at slight expense.

In addition to the record forms, the book contains engineering information including the following: Relation of belt width to size of material handled; recommmended speeds for various belt widths; table of general data listing working tensions, hourly tonnage, horsepower required and proper idler spacing for belts ranging from 12 to 48 inches in width; and a discussion of belt speeds, tension, loading chute and skirt board design, unloading methods, care of pulleys and idlers and prevention of belt injuries.

Copies of the book may be obtained by addressing the mechanical rubber goods division, B. F. Goodrich Co., Akron, O.

Looking Into the Molecule

The Structure of Metals and Alloys, by William Hume-Rothery, linen cloth, 120 pages, published by the Institute of Metals, London, and supplied through STEEL, Cleveland.

This is the first publication of the new Institute of Metals monograph and report series. Sections are devoted to the electronic background of metallurgy, the crystal structure of the elements, atomic radiuses of the elements, primary metallic solid solutions, intermediate phases in alloy systems and imperfections in crystals.

Selecting and Heat Treating Steels for Making Gears

BY JOHN T. HOWAT

CONSTANTLY changing conditions confront the gear metallurgist and the designer. A few years back a cast gear in steel or iron made within casting tolerances was considered standard production; now, the metallurgist is required to produce a machined tooth gear with physical values at least three to four times those of the old gear.

The natural sequence of such demands has been the reducing of old tolerances and the drawing up of new standards governing raw materials, combined with much closer control of processing methods.

The main material used to make gears is steel, having as a base iron with small percentages of phosphorous and sulphur as impurities to which is added carbon, silicon, manganese, nickel, chromium, molybdenum, and vanadium in varying proportion to meet the specific requirements of the gearing. Physical properties of steels can be increased by adding these carbide forming elements or by suitable heat treament. Carbon is naturally an active carbide forming element so that carbon steels are used in making the largest percentage of our gears.

Medium Carbon Steels Used

American Gear Manufacturers association (A. G. M. A.) standards for gear materials, which have been drawn up from years of experience, show that a carbide forming composition most suitable for economical production should be equivalent to a 0.30 to 0.40 carbon for cast steel and a 0.40 to 0.50 carbon for forged steel. These medium carbon steels give well balanced physical values on heat treating that will meet most of the present day service requirements, namely: High elastic limit for fatigue and impact resistance, proportionate elongation and reduction of area for ductility, and a high brinell for wear.

Physical strength of any metal is dependent on its microstructure, and the size of its grains combined with the cohesion between its crystals determines the final physical values obtained from that metal. A fine-grained structure can be produced by composition or forging, but the necessary cohesion between crystals and the microscopic grain refinement can be fully produced only by quenching and drawing the steel.

Fig. 1 shows the usual ferrite and pearlite structures which carbon steels have at normal temperature. If a steel of this type is heated to 1350 degrees Fahr., the carbide of iron and ferrite forming the pearlite areas unite to form a solid solution. On rasing the temperature still further, the ferrite or alpha iron is also dissolved to give a solid solution of gamma iron or austenite. This condition is necessary in any steel before quenching if it is desired to obtain the best physical results from the steel irrespective of its analysis.

THE accompanying article is an abstract of a paper presented at the fall meeting of the American Gear Manufacturers association. The author, John T. Howat, is associated with the Pittsburgh Steel Foundry Corp., Glassport, Pa.

The time allowed for passing the steel through the 1350 degrees Fahr. range to the quenching temperature used plus the time allowed for quenching with all other factors being correct will establish the state of the steel for final treatment. It is but natural that the higher the percentage of carbides in the steel, either of iron or complex double carbides formed by carbon or alloy additions, the greater will be the time needed for diffusing to form the austenitic condition. If insufficient soaking time is allowed for either the plain carbon or alloy steel, residual ferrite and carbides are still present in the austenite when the steel is quenched. The effectiveness of the quench is reduced and will be evident in the non-uniformity of the final results.

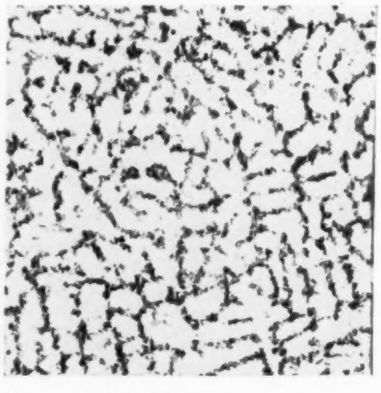
Quenching from too high a temperature or holding too long at a high temperature will produce a coarse grain with undue brittleness and subsequently greater internal stresses. The excess temperature also reacts on the quenching medium and if the same is small in volume, it may cause irregular hardening due to the liquid becoming too hot.

Hardening Produces Martensite

When the steel has been properly hardened, a martensitic structure is obtained as seen in Fig. 2. This material has a brinell hardness of 420 to 650; it is distinctly brittle, strong and hard in appearance and characteristics. It must be supported in correct proportions with the proper lower hardened constituents to give satisfactory service results. We seldom, if ever, obtain a 100 per cent martensite structure, but may have small amounts of austenite or primary troostite present with the martensite. If austenite is present, it may change over to martensite on tempering or drawing and the steel will have become harder after this treatment.

This reaction explains the higher brinell sometimes obtained on retesting after the drawing treatment and usually necessitates a second treatment to obtain the correct hardness. If the quenched steel is heated to 375 degrees Fahr., a decomposition of the martensite is started immediately to form secondary troostite, Fig. 3, which has a brinell hardness of 350 to 425, and on continued heating to 525 degrees Fahr., further breaking down of the troostite takes place to give sorbite, Fig. 4, with a brinell of 250 to 350.

Both of these microconstituents are essential in heat treated gearing as they soften the martensite field and reinforce the teeth with a toughness necessary to withstand



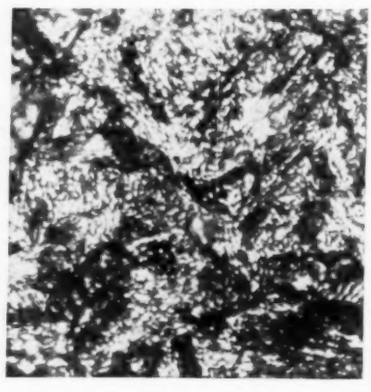


Fig. 1 (Left)—Medium carbon steel annealed, showing ferrite and pearlite. Fig. 2 (Right)—Hardened carbon steel, showing martensite and primary troostite

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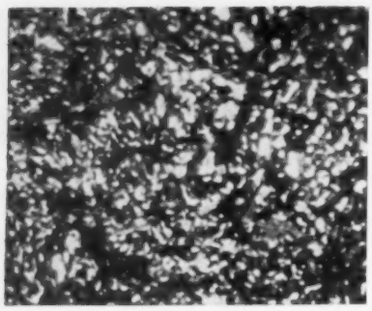

Fig. 3 (Left)—Martensitic structure with increasing troostite and sorbite. Fig. 4 (Right)—Lamellar pearlite plus some sorbite and ferrite

high impact and fatigue stresses. It is a well recognized fact that the desired structure in the teeth of a quenched gear is a martensitic structure plus a small amount of primary troostite for a depth of about ⅛ inch to at least ½ inch below the tooth face depending on the pitch of the gear. With a gradual changing over to a troostitic and sorbitic core structure and with the larger pitch gears, some pearlite and ferrite will also be present.

A short explanation of the dimensional changes that take place on heating and quenching a piece of steel may explain why excess quenching strains cause most gear failures. As steel is heated, it expands until 1350 degrees Fahr. is reached; then, as the ferrite (alpha iron) changes into austenite (gamma iron), it shrinks in size because this phase of iron is more dense than the ferrite. When this change is completed, the austenite expands, which is the condition of steels when ready for quenching.

Quenching Creates Strains

While the steel is changing from austenite to the martensite point, it contracts as it cools and as soon as the outer surface has been changed to martensite, it continues to contract. Since martensite contains alpha iron which has greater volume than gamma iron, an expansion occurs upon cooling of the martensite, and as the metal cools to the lower constituents, it keeps expanding due to the formation of more alpha iron.

It can be seen readily that in one piece of steel we may have from maximum expansion to maximum contraction if not properly heated before quenching, and it is this condition which intensifies the natural strained conditions set up by quenching. Normal quenching always will set up strain due to nonuniform sections; therefore, it is necessary to try to minimize the amount of uneven stressing with the gear. When the total stresses due to improper heating or excess quenching exceed the elastic limit of the material, then cracking occurs. The minimum amount of quenching done to produce the desired results will result in lower internal strains and therefore a safer gear.

Many pinions show the teeth uprooted across the full face of the pinion, taking a portion of the base material with them. The exposed fractured surface has a typical woody or fibrous structure running parallel with the face. The pinion blanks may have been cut from a hot rolled bar with no attempt to refine the grain by forging or annealing with the result that the original elongated structure still persists even after heat treating.

Fig. 6 shows the ferrite and pearlite banded structure from hot rolled material which should be broken up by forging or annealing to give the best results on heat treating. Commercial hot rolled bars often are rolled at too high a temperature due to high speed production, or a breakdown in the mill may cause the over soaking of the billets in the heating furnaces, with the result that from both these conditions a large grain size of a banded type is derived which is extremely difficult to break up with annealing or quenching.

The tooth loads which can be successfully transmitted by pinions having a banded structure will have to be less than the fatigue limit of pure ferrite which will be approximately 15,000 pounds per square inch. Pinions, to be used in highly stressed services or to be heat treated, should be well annealed and purchased from a reliable source of supply. The true solution to this type of failure is to use forged bars for stock material or upset pinion blanks (a blank made from a billet of such size that the finished surface material for a depth of at least ½ inch below the root diameter of the finished pinion will have been changed from a rolled or elongated structure to a refined or forged condition).

Alloy Steels Substituted

When a carbon steel gear hardened to its maximum safe hardness limit will not produce physical values high enough to meet a specific service condition, or the design of the gear will not permit of water quenching, then it is necessary to resort to an alloy steel suitably heat treated. Alloy steels in their many combinations of the elements mentioned in the early part of this paper will give a wide range of physical values on heat treating. The presence of nickel in these steels helps the solubility in the ferrite of the new carbides primed by the addition of these alloys.

Most of the complaints on oil treated gearing are from cracking. The microstructure of the alloy steels is naturally much finer grained than the carbon steels, because of the presence of the increased amount of carbides. On quenching these steels, martensite is formed to a greater depth than with the plain carbon steels so that alloy steels must be carefully quenched and drawn to a greater extent to insure fuller relieving of the quenching strains.

Fig. 5 (Left)—Steel of 0.30 per cent carbon content with large ferrite structure. Magnification 200 diameters. Fig. 6 (Right)—Changes in the structure of the steel shown in Fig. 5 after annealing

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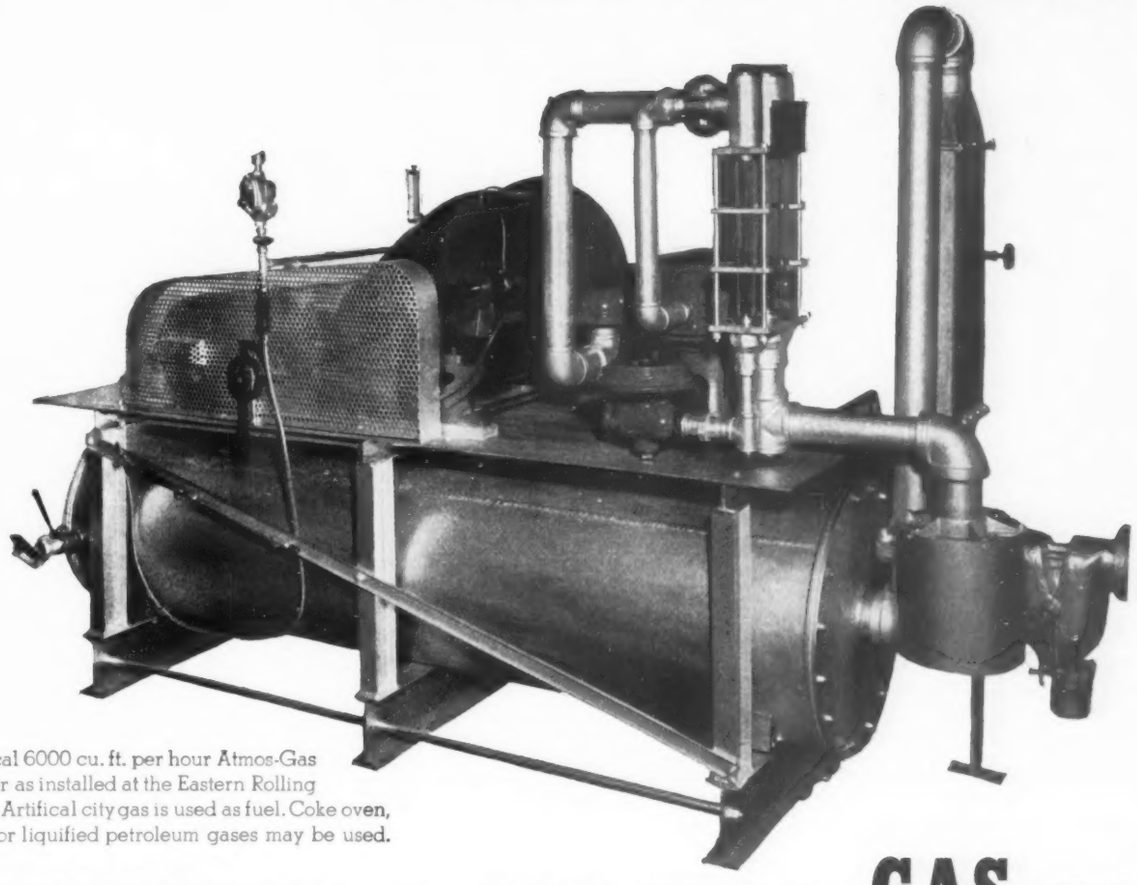

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Welded Alloy Steel Power Piping Is Finding More Extensive Application

BY G. R. DAWSON
Union Carbide & Carbon Research Laboratories Inc.,
Niagara Falls, N. Y.

POSSIBILITY of improving the thermal efficiency of steam power plants by designing and constructing them for operation at higher temperatures and pressures has long been recognized in theory. Until about six years ago, however technical considerations limited the practical upper temperature value for superheated steam to 750 degrees Fahr. Modern design and materials have since raised this value to over 1000 degrees Fahr. A more careful study of design and mechanical factors is now considered to be the chief preliminary requirement for further advances.

Today there are more than a dozen high-pressure power plants operating at a temperature of 900 degrees Fahr. or higher. Although the majority of these are in Europe or on foreign ships, some of the plants of the Detroit Edison Co. are particularly interesting because they have pioneered with the use of welded alloy steel power piping.

Special Materials Needed

The choice of materials that will give safe, efficient and lasting service involves a consideration of their strength, corrosion resistance and suitability for fabrication. The question of maintaining desirable physical and chemical properties while under stress at high temperatures is also important. A point to be emphasized is that higher temperatures require the use of special materials.

Creep strength is the chief characteristic of steam power piping. At elevated temperatures ordinary steel loses its elasticity, and when stressed becomes subject to plastic instead of elastic deformation. Since plain carbon steels do not have the necessary creep strength for satisfactory operation at high temperatures, it is necessary to use alloy steel for such applications.

Another important factor is corrosion resistance. The external corrosion of superheater or boiler tubes and of supports for piping, and the internal corrosion of valves and piping may be prevented by the use of suitable alloy steel material. Erosion can also be largely prevented.

Another requirement is that the materials used at high temperatures should have a minimum tendency toward warpage, growth, grain enlargement, or embrittlement. In other words, they should be heat resistant.

Even with alloy steel successful operation above 900 degrees Fahr. would be impractical unless a satisfactory method of fabrication existed. Economy, safety, strength, permanence and the fact that steam piping must often be concentrated in a limited space are factors that must be considered in choosing a method of fabrication. Experience already available in this field indicates that the welded joint is highly satisfactory for high-temperature pressure installations.

The economy of welding in regard to the simplified labor in the drafting room, easier ordering of parts, avoidance of delay, elimination of waste, facilitated field installation, and reduced maintenance costs gives ample evidence of the advantages of the welded piping system. Simplified insulation made possible by welding, the possibility of concentrating welded installations in limited spaces, the smoothness of the welded joint which facilitates transportation of fluids, and freedom from leaks are further advantages.

Welding Changes Requirements

Valves for power plants should be provided without flanges where possible. Steel gate valves have been welded into a line, removed by a cutting blowpipe, rescarfed, and again inserted by welding. This has been done repeatedly to the same valve without inducing leaks or undue distortion. If it should become necessary to remove a welded valve or other member for inspection, the part can be cut with oxyacetylene blowpipe.

If an alloy steel power installation is to be fabricated by welding, the choice of materials, design and type of fitting should conform to this intention. The welding procedure should be adapted to the material and design. In regard to design, such factors as suitable provision for expansion, adequate anchorage for pipes, and the use of gradual curves are often fully as important to a successful welding installation as the welding rod itself.

Adapting the welding procedure to the design and material involves such considerations as manipulative technique, choice of welding rod, stress relieving, blowpipe annealing, care in cooling, and general procedure control. Some of these are only mentioned because the field is too wide for a comprehensive discussion.

The alloys found most useful in steel suitable for high-temperature high-pressure steam equipment are: Chromium, molybdenum, vanadium, silicon, tungsten, manganese and nickel. Experimental work with columbium, nitrogen, and titanium indicates that steel with these elements also will find extensive use.

Each of these elements exerts a definite influence on the steel to which it is added, but the effect of each is modified by the presence of other elements and by the amount of carbon. It thus becomes important to obtain a proper relation between the amounts of the alloying elements in order to obtain the best results. Alloy steels in which the proportions of the various elements have been chosen so as to give the best possible combination of physical and chemical properties are now known as balanced alloy steels. Frequently one type of balanced steel can be benefited by the use of one or more additional elements. This is, at least in part, why some of the more complex alloy steels have been developed.

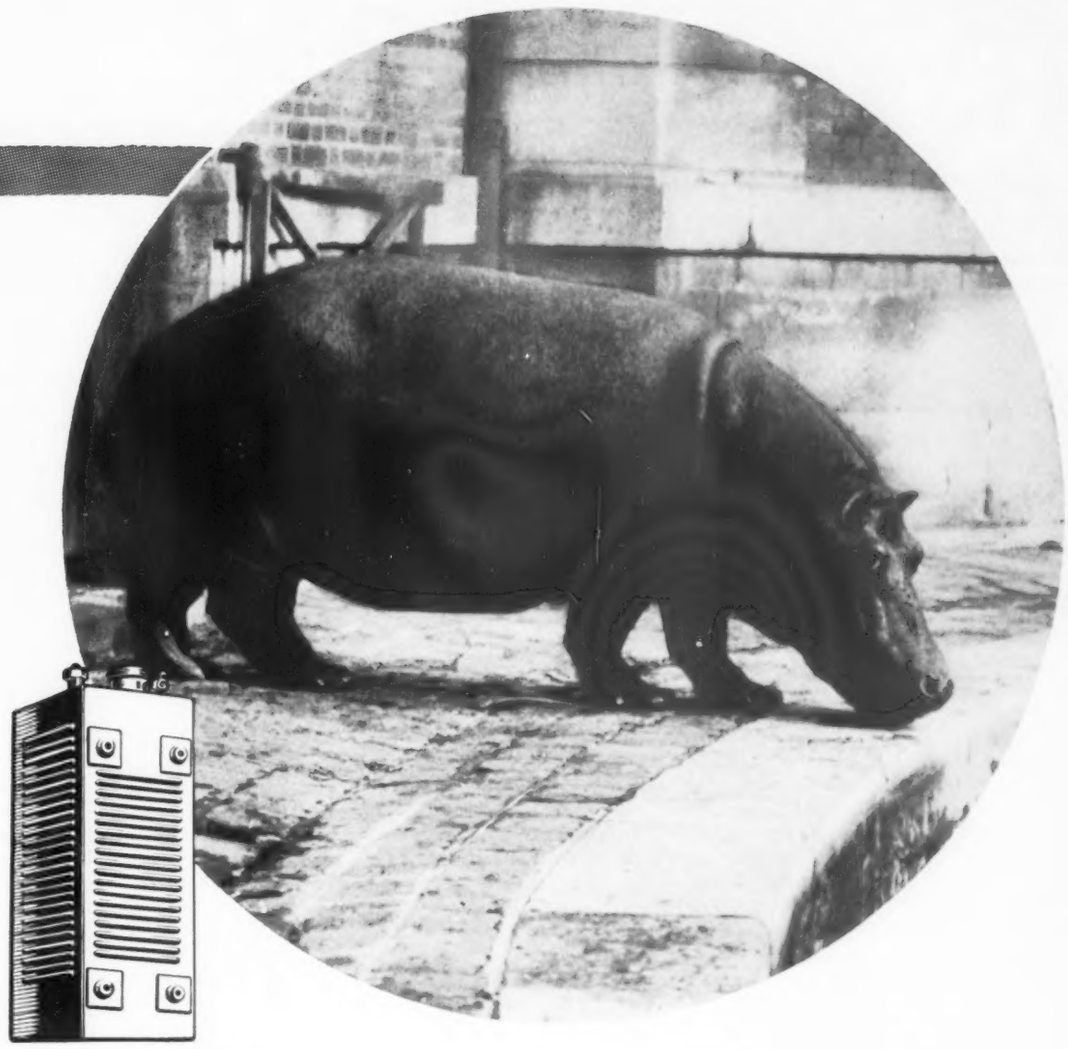
Chromium Steels Used

Practically all steels designed to be used at high temperatures contain chromium. The general effect of chromium is to increase strength, hardness, oxidation and corrosion resistance, and creep strength. Even in amounts less than 1 per cent, chromium tends definitely to improve oxidation resistance and creep strength. Balanced with manganese and silicon, its ultimate strength and creep strength are both good in contrast to plain carbon steel. The use of vanadium, molybdenum, or nickel also improves the creep strength of low chromium steels.

Chromium-type steels are giving good service at high temperatures in turbine parts, tubing for superheaters, and for reheaters. For the higher temperatures, higher chromium steels are recommended, or the 18-8 chrome-nickel stainless steel. The addition of titanium or columbium to many of these metals will no doubt increase their field of usefulness. These alloys eliminate the air hardening characteristics of the chromium steels and at the same time improve their resistance to cor-

(*Please turn to page* 66)

From a paper presented April 22 before the Sixth Midwest Power Engineering conference in Chicago.



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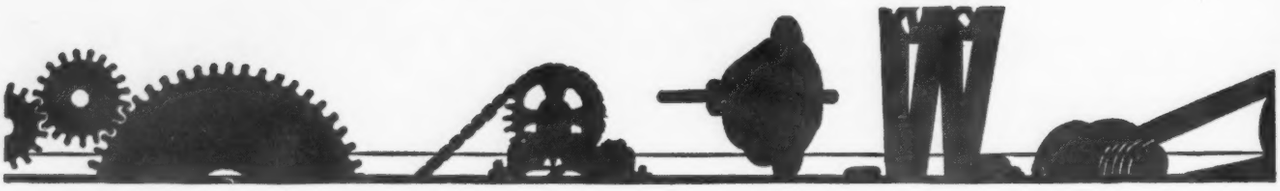

What Is Most Effective Drive Setup For Machines Not in Regular Use?

IN A PLANT recently visited by an editorial representative of STEEL five individually driven machines were set off in one corner of the shop. Practically all of the work in this shop was on small parts. One special item, however, required the machining of a few larger castings and so a 36-inch swing by 8-foot engine lathe, a large drill press, a radial drill, a shaper and a miller were purchased to handle these parts. No single part required the use of more than three of these machines and no more than three had ever operated together. Demand was low on this special item and so the year's supply has been turned out in from three to six weeks, with the machines idle the remainder of the year.

Extra Motors Unnecessary

Because of the common belief that a lineshaft drive to idle machines is a power waster, each machine was provided with an individual motor drive, with individual wiring and control. Because of the nature of the load a single motor of a horsepower rating about equal to the two larger motors would have driven all machines if they had been group driven. In general, extra wiring and control of individually motorized equipment cost as much or more than the lineshaft, both installed. This penalizes the unit installation with the additional cost of the extra motors installed and the annual fixed charges on same.

Analyze the power costs which consist of power consumed, including the friction load and efficiency loss because of motors operating underloaded, power factor penalty or its correction, and demand charge. Demand or readiness to serve charge is based on total horsepower installed and is made for the full year whether the equipment operates one day or every day, a continuous penalty on the larger rated motor capacity. Power factor losses and inefficiency of unit motors are generally greater for an individually driven installation than the friction loss of a lineshaft for a corresponding group drive. However, as all motors do not operate at any time let us assume the power consumptions equal. Incidentally, removing the belts on machines not operating would reduce the friction loss and power consumption of the lineshaft installation. It is questionable, even, whether the friction saving would make antifriction bearings economical, with such little use. Maintenance would be a minor item in either group or unit drive.

If all of these factors of transmission costs, the fixed charges, based on original cost installed, and demand charges, both of which are on an annual basis, but which must be absorbed in the short period of operation, were carefully evaluated it would be found that the unit drives are considerably more expensive. The actual cost of power for the few weeks the machines are used would be a minor item in either case and probably be about equal. The advantage, therefore, would in all probability be with a group driven installation. This illustrates the fallacy of installing equipment without carefully analyzing the costs.

Although not a transmission problem the question arises whether the entire installation is economical particularly as the city in question had numerous job shops where these special castings could have been farmed out on contract with sufficient competition to assume a fair cost of production.

• • •

Flexibility in Production

INDIVIDUAL drives on a number of machines used by a certain company in the fabrication of special steel storage racks and light structural work permit absolute flexibility in arrangement of the different machines to give the best layout for the varying work. All machines are portable and mounted on special bases so that they can be easily moved in the shop and be set in place without having to be fastened down.

The racks manufactured are all of special design and produced only at irregular intervals. Thus the equipment is arranged ordinarily for the best layout for the production of the regular product, which consists largely of light structural work However, when a special storage rack order goes into production, the machines are lined up to cut, punch, drill, bend, or rivet with the necessary spacing between each to take care of length of parts, which varies on each job. Changes in arrangement are even made at times on the same job for long and short pieces. Machines, such as drills or bending equipment, are put in line when needed and taken out when no longer necessary.

This arrangement lasts from one day up to a week or more. The work simply flows through the processing with a minimum of handling between operations. All work is carefully checked but not entirely assembled until permanently erected.

When the job is finished the machines are replaced around the shop for general production although it requires only a few minutes to shift a machine where it is less trouble to move the machine than the work.

This, of course, necessitates individual machine drive and a flexible arrangement for connecting up the machines to the power circuits. This is accomplished by mounting the starting and control equipment on machines, each with a plug or jack on a cable to connect to overhead outlets.

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When gear teeth come in surface-to-surface contact without a cushioning film of the proper lubricant the result is excessive wear, noise, and high power consumption.

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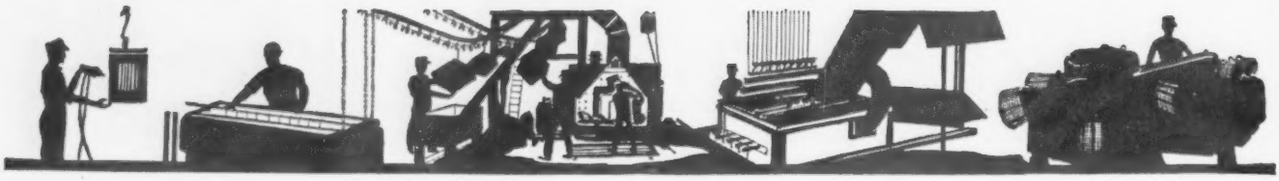


Surface Preparation, Thickness Control Are Factors in Good Enameling Practice

REJECTS, always an expensive item in any phase of production, have been a major source of trouble in the porcelain enamel industry. These rejects are caused mainly by faults which appear during the firing of the enameled parts, and by chipping which occurs during subsequent assembly, crating, shipping and service. The fact that satisfactory repair of defects is a costly matter in the plant, and practically an impossibility in the field, has prompted both producers and consumers of enameling materials to make a wide study of the problem. Considerable progress has been made in the elimination of the various causes.*

The first source of rejects is in fishscaling, copperheading and blistering, which obviously must be corrected by some modifications in the method of application. Fishscaling is an adherence failure and can be caused by improper surface treatment to too low a firing temperature. Copperheading is a rupture of the ground coat enamel, caused by localized oxidation of the base metal and a forcing through of the oxidation products. Blistering, as the term implies, is a raising of the enamel from the base metal at focal points, and is caused by the evolution of gases from the base metal.

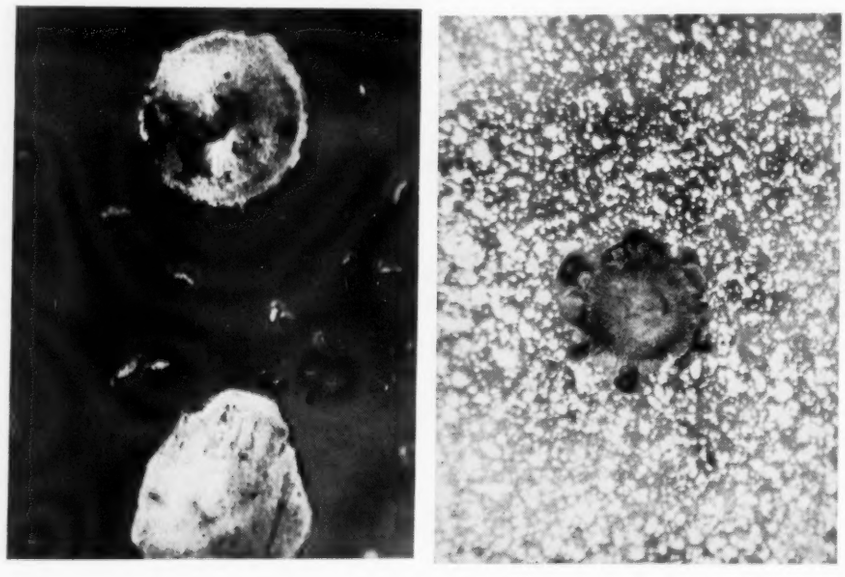
Thorough Cleaning Necessary

Since copperheading and blistering are caused by focal points of oxidation or slag inclusions, the quality of the metal and the condition of the surface just prior to the application of the enamel are most important. The steel should be free from slag inclusions and have as uniform composition as possible. Surface treatment of the metal prior to applying the enamel is most important.

It is usual practice that the steel first be cleaned with an alkaline cleaner to remove all grease and dirt. After rinsing, this should be followed by an ac'd etch (pickling) obtained by immersing the parts in a solution of approximately 6 per cent sulphuric acid at 140-160 degrees Fahr. The parts then are rinsed, neutralized and dried.

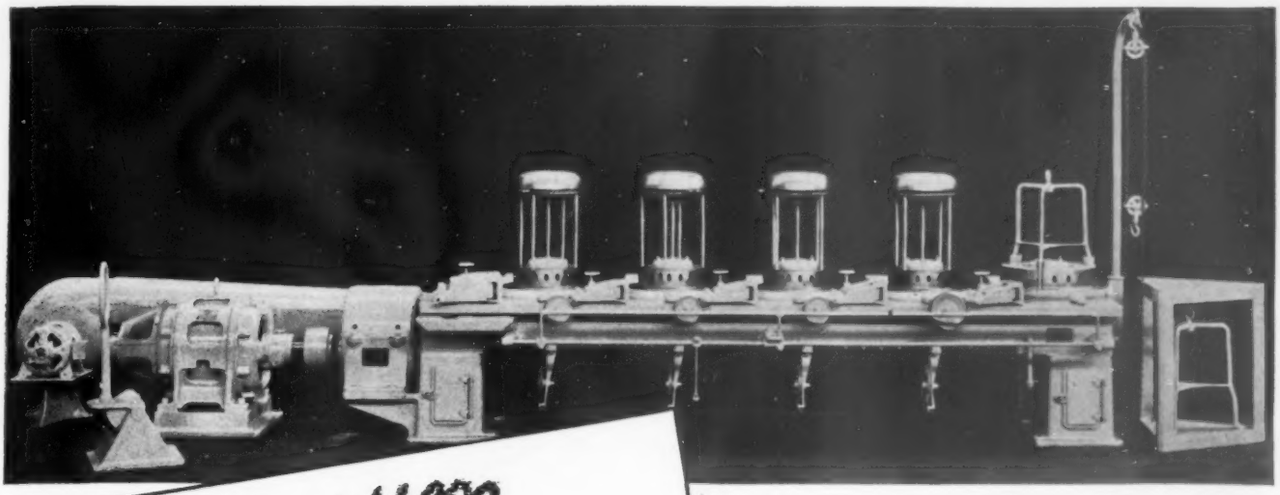
When conveyor systems are used, it has been found that excessive amounts of iron salts are sometimes deposited on the metal surface after the acid etch. Since these salts, which cannot be completely removed by rinsing with water, cause imperfections in the enamel it is necessary to remove them by some other means, and for this purpose the cyanide neutralizer has been introduced. The cyanide neutralizer is a solution of approximately 2 ounces of soda ash and 2 ounces of sodium cyanide per gallon of water, in which the parts are dipped after the acid etch, to dissolve the iron salts. The parts are then rinsed and dried, and are ready for application of the ground coat.

An additional surface treatment has been found, which not only increases the adherence of the enamel, but decreases fishscaling and copperheading to a marked degree. This treatment is the so-called "nickel dip" process which is a galvanic deposition of nickel applied after the acid etch. The nickel is deposited in the same manner that copper is deposited when a clean iron or steel surface is treated with blue vitriol (copper sulphate). In the case of nickel, however, some degree of control is necessary since nickel is much closer to iron than copper in the



Normally pickled steel ware (left), not "nickeled", with one coat of green enamel. Note poor adherence at point of impact; also note fishscaling. Right shows normally pickled steel, given nickel dip treatment and coated with same enamel. Note adherence at point of impact and freedom from fishscaling. This sample was stippled wi white enamel

* For further information see: *Journal*, American Ceramic society, Vol. 18, (No. 8), p. 225, Aug., 1935; *Ceramic Industry*, June, 1935; *Bulletin*, American Ceramic society, Vol. 14, (No. 11), p. 369, Nov., 1935.



Morgan-Connor Continuous Wire Machine, Type B. Fully equipped with motor and control, air-cooling system, clutches and safety stop.

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● Compact strength is manifest in every part of Morgan-Connor Wire Machines—excess bulk is eliminated—floor space is saved. High sustained F.P.M.—uniform quality output and low maintenance costs are typical.

The Morgan-Connor Continuous Wire Machine's high block design allows proper cooling between dies permitting greater tonnage per unit when drawing high carbon wire. By an improved clutch arrangement butt welding of stock is wholly practicable, thus making it possible to operate continuously for the life of the dies.

The Vertical Spindle Bull Block illustrated on the left is another Morgan self-contained unit. Flexible, rugged, convenient, with adjustable speed D-C motor, this machine may be used with either single- or double-deck blocks in diameters to suit the customer's needs. This wire block is built in various capacities to draw all sizes to 1″ round.

There is a Morgan Wire Machine to meet your wire making requirements—increase output and reduce costs.

Morgan Vertical Spindle Bull Block with adjustable-speed D-C motor, built-in control and double-deck block.

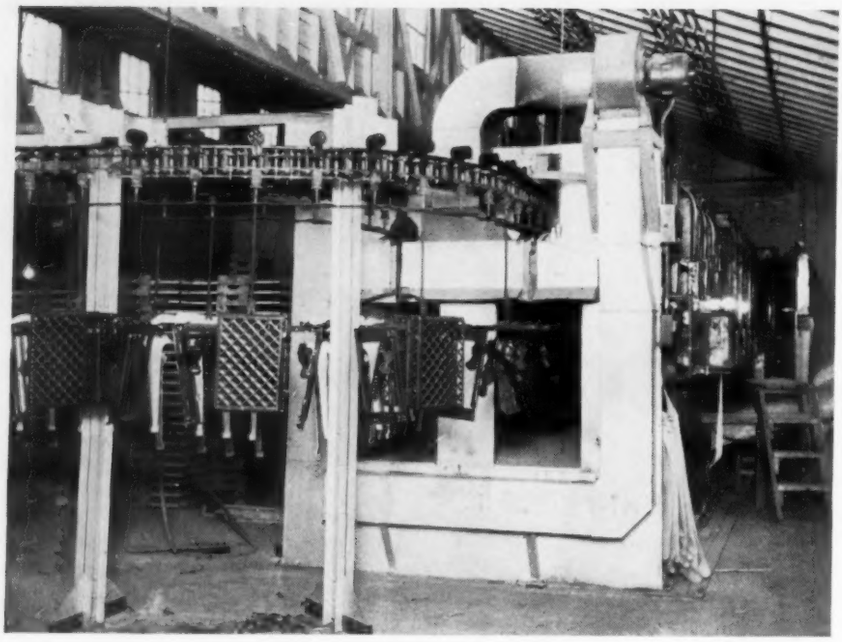
W-3

MORGAN CONSTRUCTION COMPANY

Worcester, Massachusetts, U. S. A.

MORGAN Wire Machines

MORGAN WORCESTER ENGINEERS AND MANUFACTURERS



Conveyor systems and continuous furnaces similar to those illustrated here are large factors in the production of uniform enamel finishes

electromotive series and does not deposit as readily.

In cases where a white ground coat is used, a solution of 8 ounces of single nickel salts ($NiSO_4 \cdot 7H_2O$) per gallon is used. Users of cobalt ground coats employ a 4 to 5 ounce solution. In both cases it has been demonstrated that the best deposit is obtained when the solution is held at a ρ_H between 5.6 and 6.2. Boric acid (about ¼ ounce per gallon), with or without ammonium carbonate or hydroxide, is the usual buffer salt employed as a stabilizer. When the acidity rises (ρ_H lowers), due to carryover of acid from the pickling tank, ammonium carbonate or hydroxide is used to restore the solution to the proper concentration. If the solution should become too alkaline, dilute sulphuric acid should be used. The temperatures used vary from 110 to 190 degrees Fahr., depending upon local conditions and the particular object for using the process.

Repickling Requires Caution

The tank used for this solution should be of wood or lead since the solution would react on a steel tank. The heating coils likewise should be of lead.

The nickel dip usually is followed by a water rinse and drying operation. In some cases, however, it has been found that a film of iron hydroxide forms on the surface of the metal during the nickeling; this film cannot be removed by rinsing or neutralizing. The coating is sometimes found even after treatment in a fresh nickel solution. It has been found that by giving the nickel treated steel a rinse in a 0.1 per cent solution of sulphuric acid, followed by the usual neutralizing procedure, the hydroxide is removed without removing any of the nickel deposit.

If shop conditions should require repickling, some difficulty is encountered, as repickling often causes blistering unless certain precautions are observed. The most satisfactory solution of this problem has been to segregate the parts to be repickled, reclean them in an alkaline cleaner and rinse; then repickle for only 3 minutes and follow with a second light nickel dip.

The use of the nickel dip has been found to improve the bond of the enamel to the metal. This is especially valuable in the case of white ground coats which ordinarily are not as adherent as cobalt ground coats. This adherence increasing property, combined with reduction in fishscaling, blistering and copperheading, makes the process especially important when low firing temperatures are used.

Thickness Affects Chipping Qualities

An annoying type of failure is chipping of the enamel after application, since it oftentimes requires expensive replacement operations. Since porcelain enamels are glass, and consequently brittle, chipping cannot be entirely eliminated, but it can be materially reduced. Many factors contribute to chipping including design, metal thickness, shape of parts, tolerances, types of assembly, crating, handling and others.

It is a recognized fact that thickness of coating has a direct relationship to the chipping qualities of porcelain enamel. Parts which have been rejected by inspectors are frequently recoated with enamel and the consequent increase in thickness often results in an easily chipped finish. In this respect, a definite

Production of the clean surfaces, so necessary in enameling, is facilitated by the handling equipment and general arrangement of this bright and well ventilated pickling room

standard as to the number of coats to be allowed should be adopted and the parts rejected by the inspectors should be scrapped if they exceed that standard.

Beaded edges caused by ground coat dipping, spray beading or fire beading all have a definite bearing on chipping losses. All can be controlled if proper precautions are taken with regard to removal of the dipping bead immediately after draining, and correct control of milling, consistency and spraying practice. The best conditions, which can be found by experimentation and then standardized, can be maintained by inspectors. A convenient method of measuring the thickness of enamel coatings has been found in the new electrical thickness measuring instrument now on the market.

A study in one of the large production plants has revealed that enameled parts with a thickness above 0.021-inch show losses nearly seven times greater than those with thicknesses below 0.018-inch. It has also been shown that reflectance values increase only slightly as the thickness increases above 0.018-inch. Maximum reflectance is obtained at a thickness of approximately 0.026-inch or over, but the reflectance obtained at this thickness is only about 5 per cent greater than that obtained at 0.018-inch.

From these studies it appears evident that the improved bond afforded by the nickel dip and the decreased susceptibility to chipping afforded by the use of relatively thin enamel coatings, bring the enameling industry one step closer to an ideal—impact-resisting enamel.

STEEL is indebted to J. E. Hansen, Service Director, Ferro Enamel Corp., Cleveland, for his co-operation in supplying information and illustrations for this article.

Surface Coloring of Metals Extended to Stainless Steel

BY A NEWLY developed process, chrome-nickel stainless steel may be given any desired color finish. The color is not applied as a coating, but is developed by chemical and thermal reaction and becomes an inherent characteristic of the surface of the material. The resulting surface is said to be resistant to abrasion so that material thus treated will withstand ordinary fabricating operations. Where unusual fabricating operations are required, or where heat is applied, as in welding or stress annealing, the desired color may be developed after fabrication has been completed.

Although originally intended to permit the more effective use of stainless steel in the execution of architectural designs, the new process is said to pave the way for the wider use of stainless steel in other directions. Its application, it is thought, will enable manufacturers of stainless steel products to promote new business because of the availability of color finishes as contrasted with the existing characteristic stainless steel color.

Of particular significance are the results of preliminary tests of the new color finish. These tests indicate that the new surface treatment increases the resistance of stainless steel to the attacks of hydrofluoric, nitric and other corrosive acids. It is claimed, therefore, that stainless steel so treated may prove useful for many chemical and other processing uses in which ordinary stainless steel has not hitherto proved entirely acceptable. Further tests of the new finish are in progress.

The new process has been developed by Oscar B. Bach, 305 East Forty-sixth street, New York, and is the outgrowth of his experience over many years as a craftsman in metals. During that time he has worked extensively with stainless steel and his new process results from his search for a better method of coloring this material than that of using color inlays.

Oxide Film Reflects Color

The new process, says Mr. Bach, is essentially one of treating the oxide film on stainless steel so that it will reflect the desired color. The color, he states, is obtained by covering the surface of the stainless steel with a compound and then raising the temperature to 350 to 400 degrees Fahr. The compound may be applied by brush, spray gun or by rollers. The chief factors are the proper composition of the compound and the length of time it is permitted to react with the oxide film. The process may be controlled accurately so that any desired color in the entire spectrum may be produced and reproduced at will. Mr. Bach maintains a department for industrial design in which he is seeking to develop color applications to best advantage.

The process as now developed may be used only with stainless steel. It is based on the reactions which may be obtained with steel containing chromium and nickel. There is a possibility, says Mr. Bach, of modifying the process so as to make it applicable to plain steel; this is a research problem which remains to be attacked. He believes that the addition of alloys in small quantities would make mild steel susceptible to the development of color finishes of the same kind as now produced on stainless steel. He believes that possibilities along these lines are particularly interesting because of the likelihood that such a finish would impart corrosion resistance to lesser quality steels.

Large numbers of samples in many different colors already have been produced. At the present time Mr. Bach has on exhibition at the Permanent Exhibition of Decorative Arts and Crafts, 30 Rockefeller plaza, New York, a door and accompanying trim which shortly will become a part of the permanent stainless steel exhibit in the procurement division, Treasury department, Washington. The doors are of stainless steel in natural finish while the architraves and trim are colored dull black, dull gold and bright red. In the same exhibit are numerous squares of stainless steel in various shades of brown, tan, gold, blue, green, yellow, red and scarlet. The colors shown are both bright and dull in texture.

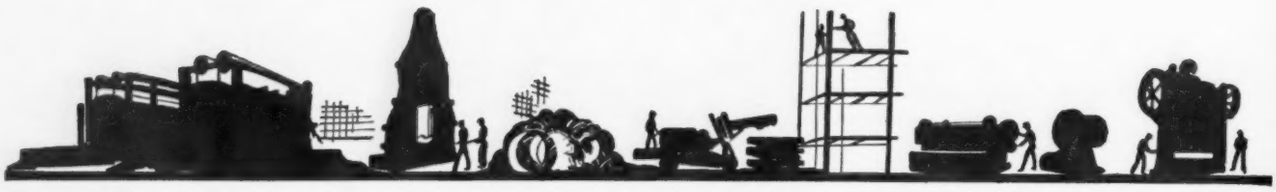
British Institute Reports Corrosion Committee Work

Iron and Steel institute, 28 Victoria street, London, S.W. 1, has published as special report No. 11, a comprehensive booklet summarizing the work of the corrosion committee of the institute and the British Iron and Steel Federation. Written by Dr. W. H. Hatfield, Messrs. Thomas Firth & John Brown Ltd., chairman of the committee, the report will be presented at the annual general meeting of the institute on May 7-8.

The joint committee was formed in 1928, and the present report constitutes the fourth which has been submitted to the Iron and Steel Industrial Research council. The purpose of the present report is to facilitate a reconsideration of the committee's research program.

Work of the committee has been three-fold: Field tests on a substantial scale; marine observations under practical conditions; and complementary investigations by the committee and by individual investigators. The 1936 report records work done to date and work in progress; numerous tables and appendices are included. Copies of the report are issued upon application to the institute.

Methods and Materials



Grease Seals Conditioned In Electric Oil Bath

A well-known make of tractors uses approximately 20 grease seals, or specially constructed leather washers, which fit over rotating shafts. As manufactured, these washers are so stiff that the slight ridges on the shaft tend to cut into the leather, thus reducing materially their efficiency as seals. To eliminate this, trouble, the washers were formerly soaked in a tank of special oil, the operation requiring approximately 48 hours.

By electrifying the tank with immersion-type heating units in conjunction with an industrial heating thermostat, it has been possible to reduce the processing time to 2½ hours. No fire hazard was involved, and there were no fumes to be exhausted, consequently cost of the equipment was small.

S S S

Protects Bearing Surfaces With Telescoping Sleeves

Telescoping sleeves protect the bearing surfaces of a slide bar employed in the suspended-wheel slide design which features internal and face grinding machines built by the Bryant Chucking Grinder Co., Springfield, Vt. This construction, shown in the accompanying illustration, also permits the use of pressure lubrication for the slide bar bearings with a totally enclosed arrangement.

By placing the slide bearings above the coolant and grit, maintenance expense is reduced. Moreover, the idea presents decided advantages in wheel control as it involves the use of one slide only.

As the bar by which the wheel slide is suspended reciprocates, the sleeves telescope together. The grinding wheel is midway between the cross-feed screw and the axis of the wheel slide bar. Thus 0.002-inch at the cross-feed gives only 0.001-inch movement at the work, insuring greater accuracy. Also, 1 pound of pressure on the feed screw gives 2 pounds of pressure at the grinding wheel. The counterbalanced wheel slide takes up the backlash of the cross screw, and sizing to close limits is simplified.

S S S

Lighter, Stronger Steels Find Use in Locomotives

Locomotive builders for some time have been building frames and other stationary parts of certain low-alloy, high-yield strength steels. A new development is the launching of an effort on their part to redesign the moving parts of locomotives, so as to make these parts lighter by building them of stronger materials.

It is believed in some quarters that this development will pave the way to ultimate widespread use of some of the newer alloy, high-yield strength steels in the construction of moving parts of mechanical assemblies in general, with resulting increases in the operating efficiencies.

S S S

Tin Increases Ductility of Aluminum-Copper Alloys

Large increases in ductility of aluminum-copper alloys containing from 2 to 12 per cent copper can be obtained through the addition of 0.005 to 0.10 per cent tin, provided the alloy is free from magnesium. A recent patent describing the development states that a casting alloy containing 4.25 per cent copper, heat treated at 515 degrees Fahr. for 16 hours, had an elongation of 5 per cent. Addition of 0.03 per cent tin with the same treatment increased the elongation to 8.4 per cent. An alloy containing 4 per cent copper and 5 per cent silicon with the same heat treatment had its elongation increased from 1.6 per cent to 5.4 per cent by the addition of 0.05 per cent tin.

S S S

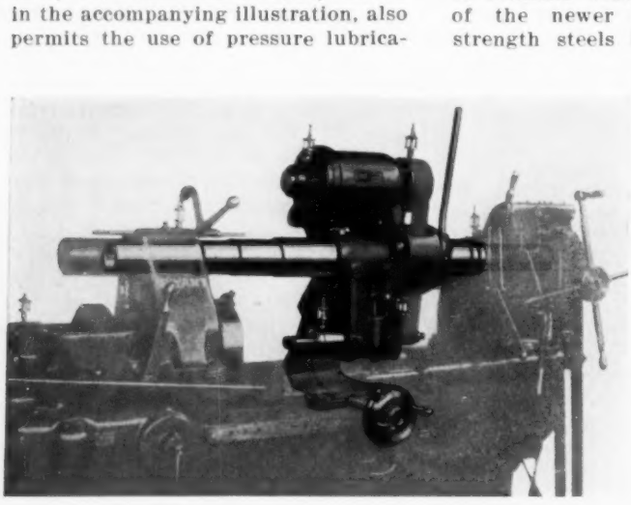
Individual Compressors Supply Air in Foundry

During the period of slack operation, a large foundry found its compressor equipment expensive to operate. Further, for the limited demands, the air supplied was far in excess of requirements. The purchase of a small individual compressor similar in type to those used in garages and provided with suitable connections for attaching to individual equipment was found to be both efficient and economical. This company has added a number of such units with the increasing demands for compressed air.

S S S

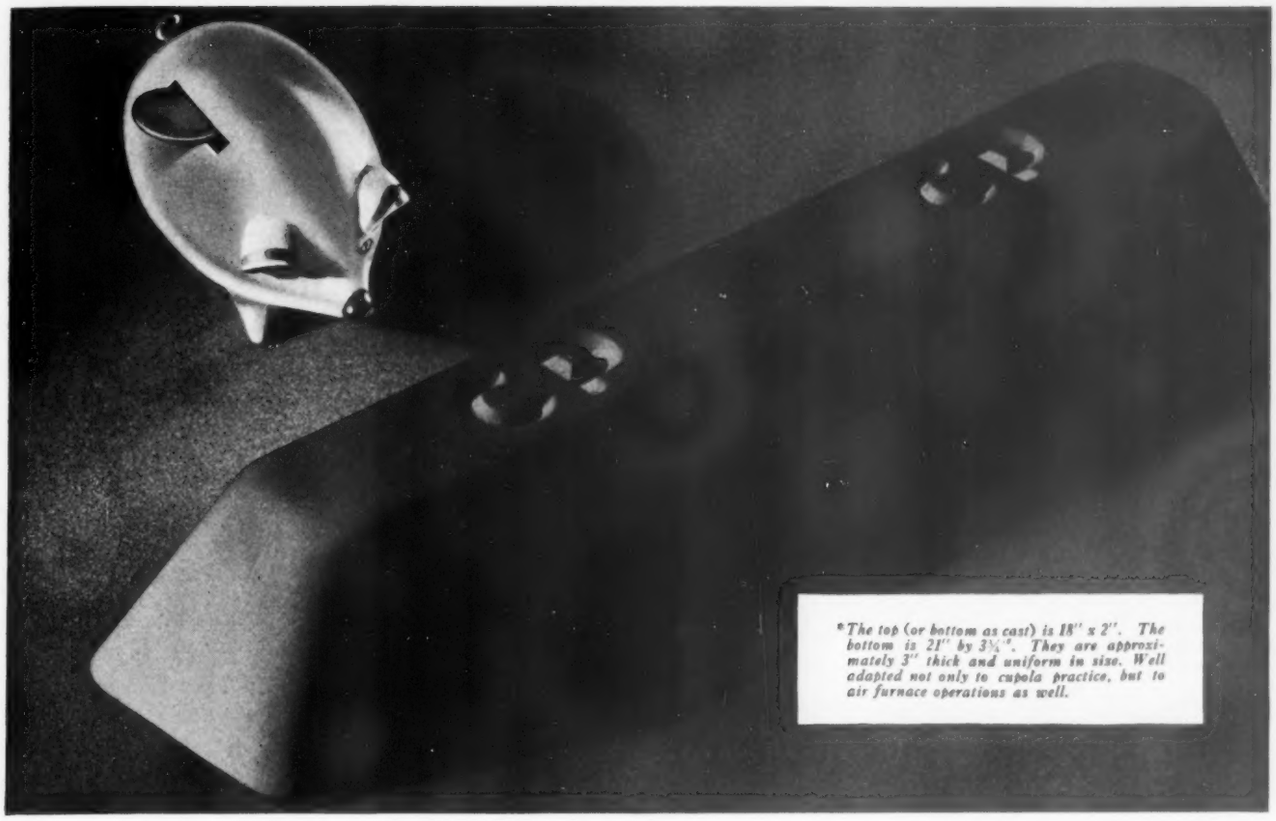
Cast Iron for Brake Drums

A manufacturer of cast brake drums uses a metal containing 0.15 to 0.25 per cent chromium and 0.07 to 0.15 per cent nickel. The casting has a brinell hardness of 187 to 228 and is said to provide an excellent braking surface.



By use of telescoping sleeves the bearing surfaces of the grinder wheel slide are protected

THESE "*little Pigs*" WILL SAVE YOU MONEY!


*The top (or bottom as cast) is 18" x 2". The bottom is 21" by 3¼". They are approximately 3" thick and uniform in size. Well adapted not only to cupola practice, but to air furnace operations as well.

Announcing CARILLCO PIGLETS

SMALL, weighing only about 40 lbs., Carillco Piglets are designed to save money by increasing speed in handling, charging, and melting. They make better, more uniform castings possible at lower cost. They decrease foundry losses . . . reduce labor cost . . . shorten melting time . . . save fuel.

Carillco Piglets, in short, are better pig iron in an improved, common-sense form*. Their size, shape and the processes used in their manufacture give them a more refined grain structure and also tend to control the carbon in solution, thus preventing the formation of kish.

The small size of Carillco Piglets makes it possible to distribute the iron in the cupola charge more easily and uniformly. Their uniformity in size tends to produce greater uniformity in melting. Their trapezoid shaped cross-section exposes more surface per pound of metal, and also permits heat to reach the interior of the pig evenly from all directions. These features combine to make absorption of heat more rapid and uniform, so that Carillco Piglets will melt quicker and with less fuel.

Investigate Carillco Piglets. Initials "CP" cast intaglio on the top quickly identify them.

CARNEGIE-ILLINOIS STEEL CORPORATION · *Pittsburgh, Pa.*

Southern Pig Iron in standard form, produced by Tennessee Coal, Iron & Railroad Company, is also available for shipment throughout the North and South.

See our Exhibit

FOUNDRY SHOW

DETROIT

MAY 4TH TO 9TH — **SPACE 331 - 3 - 5**

UNITED STATES STEEL

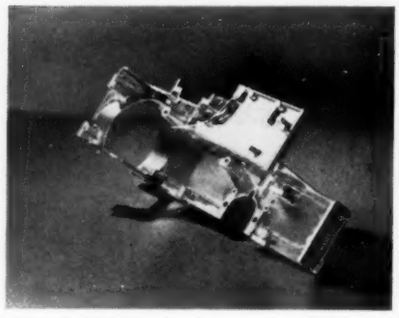
ALL-ELECTRIC typewriter, for quiet and high speed operation, comprises about 600 parts. Most of them are of steel, some of magnesium alloy, cast iron and brass tubing

Improved All-Electric Typewriter Is Designed for Quietness and Speed

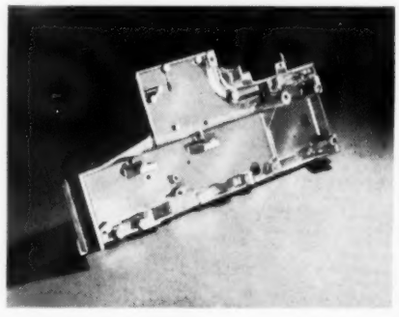
DEPARTURES from conventional typewriter design and construction are reflected in the improved, all-electric typewriter recently developed by International Writing Machine division, Batavia, N. Y., of International Business Machines Corp., New York. The changes made have been aimed at quieting the operation of the machine and of its motor drive, and at speeding up performance. The new motor, rubber mounted for quietness and isolation of vibration, has even speed regardless of fluctuations in the electric current, does not heat up and works either on direct or alternating current. Its greater power permits it to return any length of carriage at even speed. At the speed with which it operates the basket speed has been improved so as to be silent. The improved, metal-cored platen operates more quietly. A governor, to prevent excessive carriage speed on long, tabular jumps, with consequent noise and possible injury to the stops, has been installed in the spring drums.

With the addition of key-setting and clearing for tabular stops, it now is possible for the operator to perform all typing operations without removing the hands from the keyboard. These include typing, spacing, shifting, back-spacing, returning the carriage, line spacing, tabulating, setting or clearing tabulator stops, reversing or shifting the ribbon and operating the marginal release. All but the last of these operations are performed electrically, requiring only a slight depression of the key to engage the mechanism. A duplicating stencil written on this machine by twenty different people, a line apiece, it is stated, will produce copies in which the color and impression are uniform throughout, for there is no possibility of one touch being different from another.

Unusual care was exercised in selecting materials for the construction of the new all-electric typewriter. The base, which is in four separate castings, the cover, inner frame and gear housing are aluminum alloy die castings. With a few exceptions the remainder of the six hundred parts are of low carbon, thin gage steel, stamped and formed to meet requirements. Key levers, bell cranks, type bars, cam units and the plates and guides in which they are assembled are of this group. The cam units consist of five stampings made into a frame of bell crank shape which holds a 2-lobe cam and release levers. These working parts with the type, type segment, ribbon control and feed mechanism, and the necessary springs and linkages, form a separate unit of the machine which

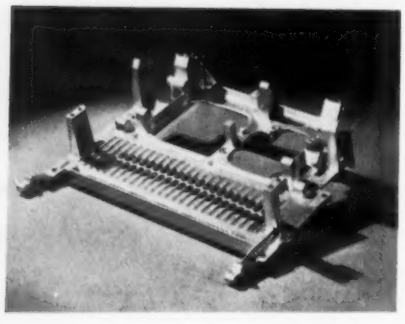


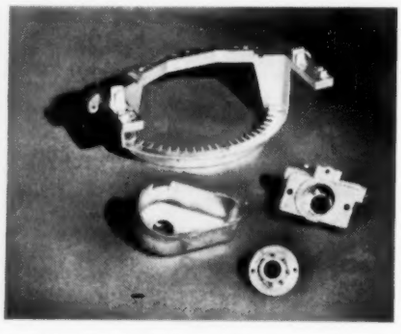
Above, right view, and below, left view of the die cast base

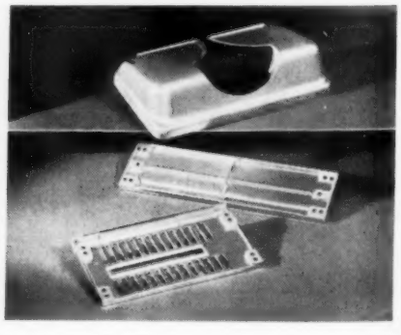


BELOW are die castings for the electromatic typewriter. Left to right, power mechanism frame; type basket, clutch cover, housing and housing cover and top cover, rear and front plates

Photos courtesy Doehler Die Casting Co., Toledo, O.







is held in the die cast base by four screws, making assembly and removal for repair or replacement more easily accomplished.

Carriage and front and rear rails are of S.A.E. 1010 extruded steel. The rear rail is a separate assembly unit held in place by two screws. On it are assembled the backspacer, tabulating parts, governor control lever and escapement pawls. These parts are low carbon steel stampings except for the escapement pawls which, to meet wear and stress, are of high-carbon steel. Of the total weight per machine, 57 per cent, or 20 pounds 6 ounces, is steel.

The power roll is a rubber tube pressed over a Dowmetal tubular core into which bushings are pressed. The cams are assembled in rows on each side of this roll. Pressing the key lever with a two-ounce pressure releases the cam against the roll, the frame of the cam acting as a bell crank to transmit power to the type bars or to another bell crank, operating back-spacer, carriage return pulley and shift mechanism.

The fractional horsepower motor is mounted on four rubber bushings and is connected by a flexible coupling to an 11-1 reduction gear which in turn drives the power roll and carriage return pulley shaft. By resilient mounting and the flexible coupling, noise is reduced and vibration isolated. Felt is held by a plastic cement to the inside of the cover and front plate to deaden sound. Patented black molded key buttons, red plastic platen knobs, cadmium and chromium plated metal parts, and a black lacquer finish, give the machine a neat and modern appearance.

New Circular Describes Properties of Iron Alloys

Entitled "Production, Heat Treatment, and Properties of Iron Alloys," circular C409 has recently been issued by the national bureau of standards, Washington. It is a general treatment covering in an elementary way the development and properties of iron alloys and the methods of producing them. Special emphasis has been placed on methods of heat treating steel and the newer developments in this field. A section of the circular is devoted to the composition and properties of the newer alloy steels.

The 40-page circular, written by Louis Jordan, was published in response to numerous requests, and should cover a real need for a simplified statement covering this subject. The text is supplemented by a bibliography of both elementary and advanced books on the subjects touched. Copies of the circular are obtainable from the superintendent of documents, Washington, at 10 cents each.

1936 Marks Fiftieth Anniversary of Invention of Resistance Welding

RESISTANCE welding plays such an important part in the manufacture of so many products in common use today that it is difficult to believe this well-known process of joining metals did not exist before 1886. Yet it was not until March of that year that Elihu Thomson, the inventor, applied for basic patents on his "Thomson Process of Electric Resistance Welding."

The first welder, shown in the accompanying illustration, was a crude device—little more than a simple transformer fitted with a clamp and a pair of electrodes and while it was extremely limited in the size and type of work it would do, no doubt existed about its ability to join metals quickly and effectively.

Whether it was because the advantages of the process were readily apparent or because industry was beginning to look more favorably on new developments, resistance welding was adopted more rapidly than most inventions. Just two years after inventing the process, Elihu Thomson founded the Thomson Electric Welding Co. to develop the process and to manufacture and sell the machines.

Within a few years, resistance welding was in common use in more than a hundred applications. It is interesting to note that the wagon and carriage industry and the bicycle industry were two of the first to make general use of the process. Today, hundreds of applications in the automotive industry alone could be listed.

Welding pipe, fixtures and hardware for refrigerators was another early application of the process. Ice, gas and electric refrigerators now are made almost entirely of metal and the number and variety of resistance welders required to produce them rival those in the automotive industry.

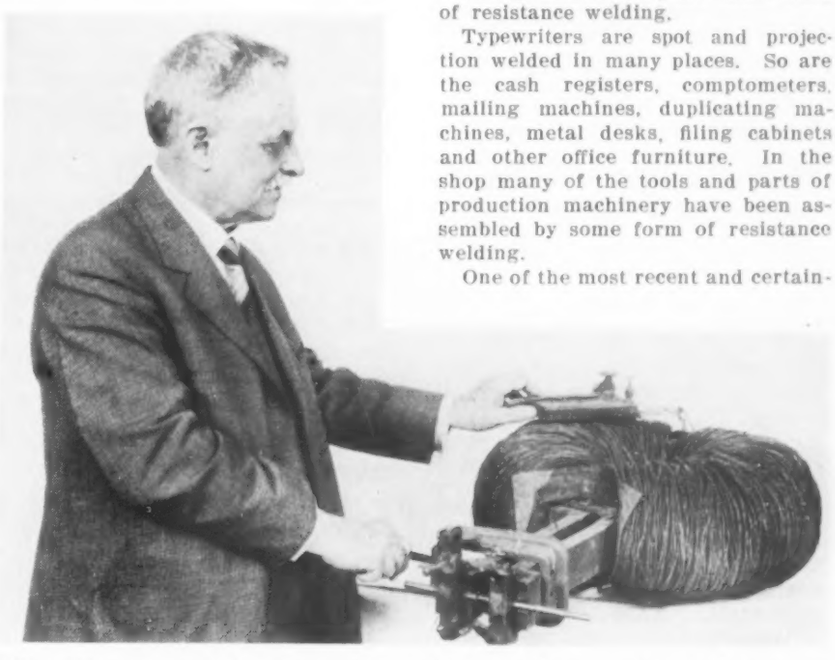
Not only have the number and varieties of welders used in these industries increased tremendously in the past 50 years, but hundreds of new products have been developed which require some form of resistance welding in production. Many of these are items regarded as indispensable necessities.

Some Ordinary Uses

For example, most lamps used in the home are resistance welded, and even the tungsten filament in the electric-light bulb is flash welded to the lead-in wires. Stainless steel knives are flash welded to mild steel shanks, which in turn, are embedded in synthetic plastic handles. The Monel metal sink is flash welded, and the Monel or Everdur hot water tank is seam and spot welded. The electric or gas range is assembled by welding. Stainless pots, pans, and trays are spot welded in many places. The vacuum cleaner and the electric washing machine require their share of resistance welding.

Typewriters are spot and projection welded in many places. So are the cash registers, comptometers, mailing machines, duplicating machines, metal desks, filing cabinets and other office furniture. In the shop many of the tools and parts of production machinery have been assembled by some form of resistance welding.

One of the most recent and certain-



Elihu Thomson and the first electric welding transformer with single-turn secondary built early in 1886

ly one of the most interesting resistance welding developments from the point of view of the metalworking industries, is a flash welder designed for welding coiled strip steel in steel mills. It joins the single coils produced in the hot rolling mills into a single continuous strip which can be pickled and finished without waste and with greater uniformity.

To have contributed one invention half as far reaching in its effect on manufacturing methods as the Thomson process would have been an outstanding achievement for any man. To know that Professor Thomson is responsible for development of hundreds of electrical devices of every possible type including generators, motors, lamps, lightning arrestors, circuit breakers, meters, switches, welders, insulators, transformers and countless others, affords some indication of his genius. More than 700 patents in the United States alone relate to his work.

As a result of these inventions and in tribute to his scientific work, Professor Thomson has been distinguished with scores of medals, honors and degrees, both in this country and abroad. One of the most recent honors was conferred on him on March 29, 1935, his eighty-second birthday. He was presented with the Grashof medal by the Verien Deutscher Ingenieures of Germany, one of the oldest and largest engineering societies in the world. Some of the other medals and awards received by Professor Thomson include the John Scott medal, 1888 and 1901; Grand Prix of the Paris exposition, 1889 and 1900; Legion D'Honneur, 1889; Trans-Mississippi exposition medal, 1898; Rumford medal, 1901; Louisiana Purchase exposition medal, 1904; First Edison medal, 1909; Elliott Cresson medal, 1912; John Fritz medal, 1916; Hughes medal, 1916; Kelvin medal, 1924; Franklin medal, 1924; and Faraday medal, 1927.

Welded Alloy Steel Piping

(*Concluded from Page* 48)

rosion. Steels containing 20 to 30 per cent chromium can be depended upon to give long service under oxidizing conditions at temperatures up to at least 2000 degrees Fahr. It has been found that nitrogen is effective in refining the grain and improving the physical properties of some of these steels.

Oxyacetylene welding is particularly adapted to the fabrication of these steels for power plant installation because of the facility with which the work is done in close quarters. Superheater tubes have been fusion welded for many years, and welded boiler drums are becoming more generally used and should result in lowering the unit cost of the steam generating plant.

Welding, etc. . . .

by Robert E. Kinkead

IN THIS column, the author, well-known consulting engineer in welding, is given wide latitude in presenting his views. They do not necessarily coincide with those of the editors of STEEL.

Tough Job

HAVING just been through a case of "trouble" in which a considerable group of people proposed to move heaven and earth to get a weld which would be "just like the original metal," the difficulties in the way of such accomplishment may discourage others.

To the best of our knowledge and belief no one ever made a weld which when completed and cold was identical to the metals joined. Subsequent heat treatment might bring a close approach to identity between weld metal and parent metal but absolute identity even in cast metals is difficult to imagine. Where the weld is not to be subjected to hot or cold work, there is usually no useful purpose served in trying to make weld metal the same as parent metal in physical properties. In commercial practice desirable properties in the weld metal are usually made superior to those in the parent metal—at no extra cost.

Where welds are to be hot or cold worked, the desirability of identical physical properties with those of adjacent metal is obvious. Making the weld better than the adjacent metal may not be much more desirable than making it worse. Nature has given the welding man some leeway in these circumstances where the metal is deep-drawing steel by the shape of the stress-strain characteristic. But in the case of low and high alloys, making the weld anything near like the adjacent parent metal for subsequent mechanical treatment is a job that does practically require the movement of heaven and earth.

Welded Alloy Inserts

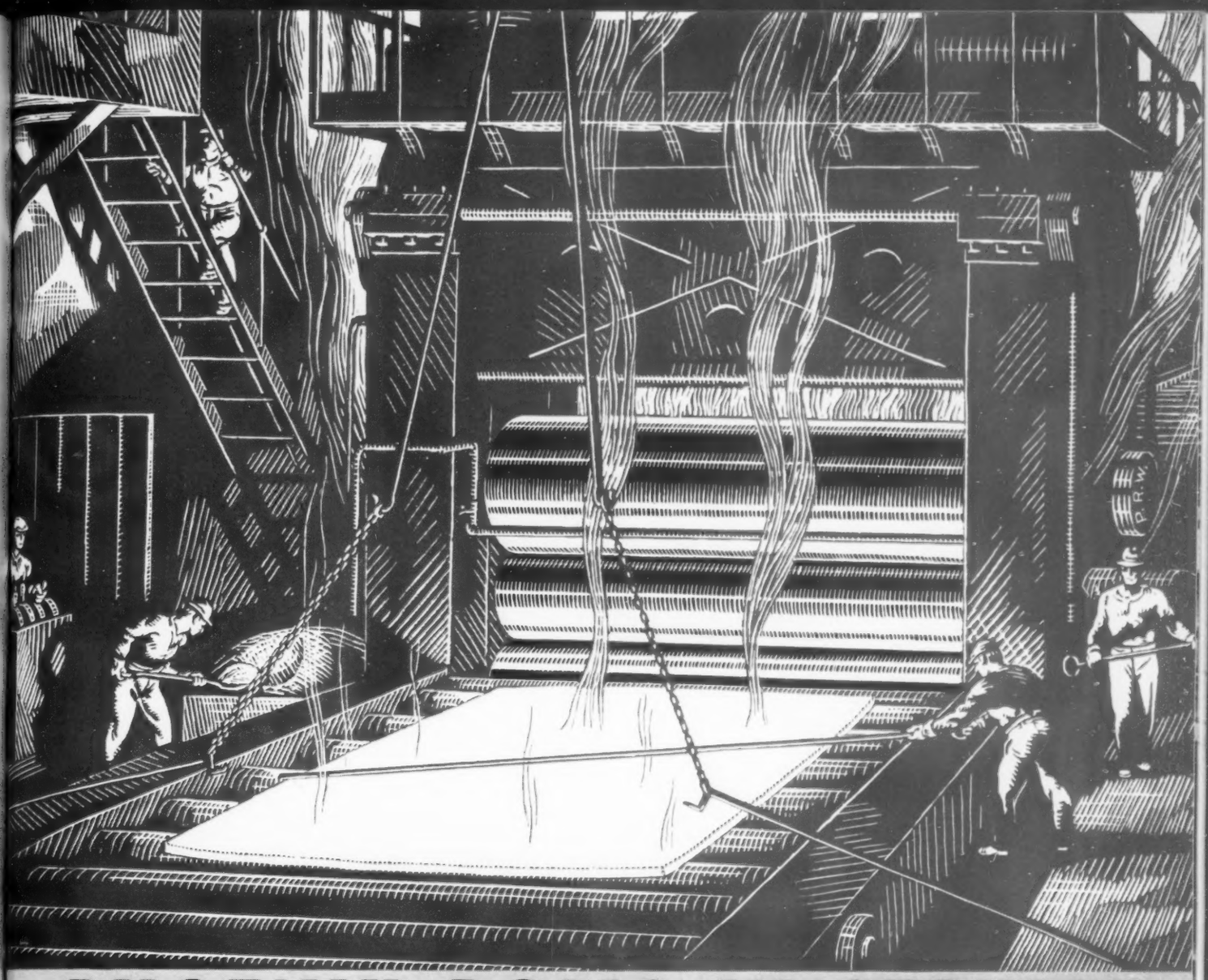
WELDING went into railroad repair shops by way of making repairs in and around steam locomotive fireboxes. Yet, there remain many economies which have not yet been accomplished during the 25 years the railroads have used welding for locomotive repairs.

The welding of tubes to the back flue-sheet and welding fire-cracks elsewhere in the firebox originally were intended to cure the effects of bad water. It was found better to cure the water conditions. But even with syphons and good water, there are places in the firebox where the metal wears out before the remainder is even damaged. Welding is used to make repairs under such conditions. New economies could be effected by welding in suitable alloys at points where rapid deterioration normally takes place—before the firebox is ever put into service. Saving the price of one engine failure alone would pay the cost many times over and leave a handsome profit.

While the situation with reference to locomotive fireboxes is significant in itself, it is only one of many similar cases where application of welding to *new* machinery would add greatly to its value. The possibilities of price cutting in the sale of machinery were exhausted a year ago as a means of earning profits. The proper application of welding to make better machinery which will last longer, as a means to this end, is well worth exploration on the part of any machinery builder.

* * *

The season for "government" work around the welding shops has arrived. Everyone from the president of the company down has a spade, lawn mower, bicycle, lawn roller, automobile bumper or something that needs the kind of attention only a welder can give. The latest story is about a garage mechanic who is making a reputation with a small alternating-current welder and some pure silver wire. He makes a practice of welding repairs on gold dental plates and bridges for the surrounding populace.



PHOENIX ROLLS IN SERVICE

The proof of roll quality is service in the mill. Long life, maintenance of gauge and freedom from the thousand and one troubles that are possible in rolling result in operating economy. Phoenix Rolls stand squarely on their service records. The best and most worthwhile recommendations for Phoenix Rolls come directly from men who use them.

PHOENIX ROLLS

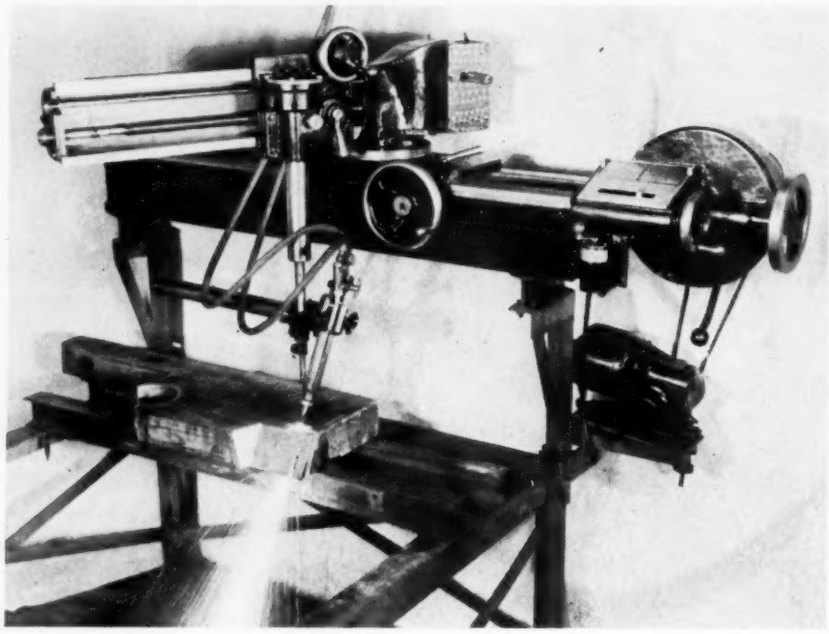
PHOENIX STEEL, for unusual strength; PHOENIX "A" (steel alloy), for strength and wear; PHOENIX METAL—PHOENIX "K", for strength, wear and finish; PHOENIXLOY (uniformly hard), for flat rolling where high finish of extremely thin gauge of material is required to be free from all marks or defects. PHOENIX CHILL; PHOENIX NICKEL CHILL; for all flat rolling requiring finish. Also tube mill rolls of quality material best suited to the kind of service required.

PITTSBURGH ROLLS CORPORATION

PITTSBURGH, PA.

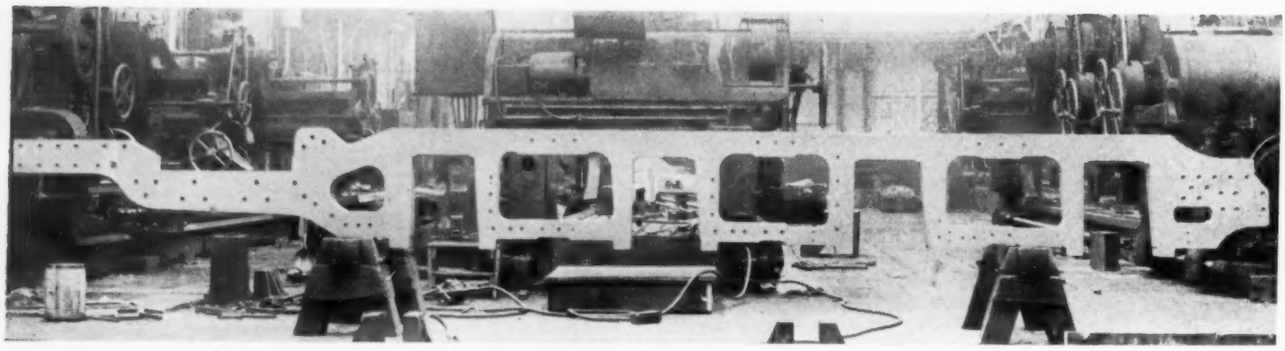
David and Goliath of Flame Cutting

Small Shapes Cut Without Templates



THIS flame cutting machine, designed primarily for jobbing and tool shop work, is manufactured by the Schoitz Tool Gear & Machine Co., Waterloo, Iowa. The machine uses any standard oxygen blowpipe, makes straightline cuts in either direction from all movements at 90 degrees or any bevel to the plane. It is adjustable for cutting at any angle to the bed. It cuts true circles, or shapes in combinations of straight lines and true circles without the use of tracer or template. The longitudinal cutting range is 38 inches, cross travel is 17 inches and stock up to 6 inches in thickness can be handled

Side Frames Gas Cut From 6-Inch Slabs



FOUR locomotives of the 2-8-4 type for heavy freight service have been completed by the Lima Locomotive Works Inc., Lima, O., for the Detroit, Toledo and Ironton railroad. An unusual feature of these locomotives is the frames which have been cut by oxyacetylene torch from rolled steel slabs. The rolled steel slab frame and its production have been developed by this manufacturer, working with the Carnegie-Illinois Steel Corp. The material used is a 6-inch slab of normalized and tempered carbon steel possessing a high degree of homogeneity. Test pieces taken at scattered points from the metal cut out revealed a maximum variation in yield point of 40,540 to 45,180 pounds per square inch, and in ultimate strength of 71,800 to 79,940 pounds per square inch. Elongations were confined between 29.5 and 32 per cent and the reduction in area between 53.3 and 56 per cent. The frames are spaced on 40-inch centers and are joined by the usual cast steel bracing, including rear deck and front bumper castings. Plans are being made to cut similar but lighter weight frames from low-alloy high-tensile steel slabs

Progress in Steelmaking

Lowers Surface Scratches

Surface imperfections on steel plates have been minimized at a Midwestern plate mill by the installation of nickel iron rolls in the runout table. Since the tables were placed in service four years ago, the number of plates rejected as a result of scratches has decreased. Wear on the front and back shear table rolls has averaged only 1/32-inch in four years.

• • •

Serves As Foundation Coat

Rust on the surface of iron and steel is used by a newly developed primer as an inhibitive pigment. The new liquid, which penetrates, permeates and diffuses through the rust also grouts it and forms a foundation for exposure coats. The primer insulates each particle of rust from the others and also from the base metal; its application serves to protect the exposure coats from attack from within the metal itself. The primer coat, however, forms a second line of resistance in case of failure of the exposure coats. The primer, which is a blend of natural oils, dries in about 48 hours and provides an insulating priming coat between the ferrous base metal and an applied coating such as aluminum paint. It also serves as a vehicle for aluminum powder as an exposure coat.

• • •

Devises Primer for Steel

Extensive laboratory work has resulted in the development of a new rust inhibitive pigment for priming steel sash, exteriors of water tanks, gas holders,. central station equipment and other applications. The new product has been tested on panels in many sections of the country including seashore, rural and industrial areas with uniform and satisfactory results.

• • •

Protects Surface of Metal

No other coating need be used with a newly designed rust preventative which is spread on metal surfaces by wiping, brushing, dipping or spraying. The protective, varnish-like compound dries to a hard film, which is impervious to water and capable of sealing the surface from air, thus effecting a long-time protection of the metal against rust. The new preventative is a combination of volatile solvent with a non-volatile portion. Careful processing, blending and controlling the long oil spar-varnish in the nonvolatile base impart the service characteristics. The coating is made in a variety of grades ranging from a thin, fast-drying product to a heavy general-purpose product for use where a nonremovable, transparent and water-resisting coating is desired.

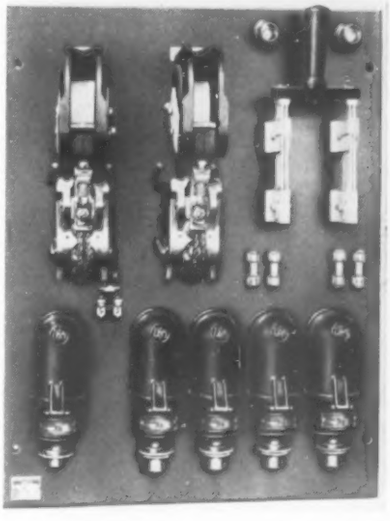
• • •

Markets Alloy Steel Tubes

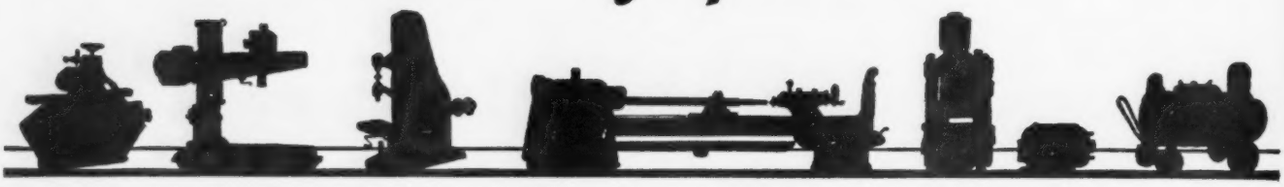
Seamless tubes and pipe of highly alloyed steel containing 25 per cent chromium and 20 per cent nickel now are being manufactured by a Pennsylvania tubemaker. This alloy has a high degree of oxidation resistance and withstands temperatures up to 2100 degrees Fahr. at continuous operation. Its properties make it applicable for high-temperature equipment such as recuperators, thermocouple protection tubes, valves and heat-resistant tubular members. Heretofore this alloy has not been available in the form of seamless tubes except through a tedious forging and boring process.

Open-Type Panel Designed to Protect Control Equipment on Steel Plant Cranes

PROTECTION of electrical equipment on overhead traveling and locomotive cranes is afforded by the development of a new type panel for use in place of circuit breakers, knife switches, fuses, etc. which otherwise are necessary in the crane cab. The new panel incorporates all of the necessary protective devices into a single, compact unit requiring a minimum amount of space. The panels are complete with main line contactors, knife switch, receptacles for pilot lights to show the operator when the power to the crane is alive, an instantaneous overload relay in one side of the line, and an inverse time element overload relay in the opposite side of the line for each motor and a separately mounted push button for closing the contactors or resetting them after they have been tripped by an overload. Two single pole contactors are used for the main line and are closed in sequence. This method of operation provides the feature that both are free to trip and will open immediately if an overload exists while they are being closed or at any time the crane is being operated. The main line knife switch is arranged for padlocking in the open position to prevent operation of the crane during idle periods or when repairs or adjustments to the cranes are desired. The panel, made in three styles, is a product of the Electric Controller & Mfg. Co., Cleveland



New Equipment



Industrial Tractor—

Towmotor Inc., 1226 East 152 street, Cleveland, is announcing a new model K tractor, the frame and bumpers of which are one integral electric welded unit. Full spring sus-

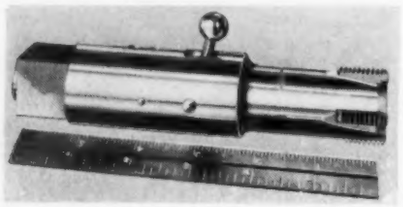
Towmotor model K industrial tractor

pension on both axles and dual driving tires also are features. The unit, shown herewith, is powered by a four-cylinder heavy industrial type motor and is equipped with magneto or battery and starting equipment. An extra large clutch with simple adjustment operates a special transmission with two speeds forward and one reverse. The reverse is the same speed as forward high. Entire power plant is removable for quick servicing. Full floating double reduction rear axle and heavy cast disk wheels equipped with solid rubber tires are used. Overall length is 68 inches with a height of 51 inches. The tractor is capable of making a complete turn in a 5 foot radius.

♦ ♦ ♦

Collapsible Hand Tap—

Landis Machine Co., Inc., Waynesboro, Pa., is announcing an improved hand sizing tap of the collapsible type. The accompanying illustration shows the 1⅜-inch size, with an overall length of only 6 inches. It can be



Landis collapsible hand tap

furnished in all sizes from 1⅜ to 12 inches inclusive. The device offers the advantage of instant withdrawal from the work without requiring backing out and also eliminates tearing of the threads. A small handle or trigger is located on the side of the tap body for unlatching the tap and collapsing the chasers. Chasers are reset by pressing against a plunger extending slightly beyond the rear of the tap shank. The tap is provided with a diametrical adjustment of approximately 1/32 inch both over and under the nominal chaser size. An adjusting screw is located in the front end of the tap and is of the ratchet type, making it

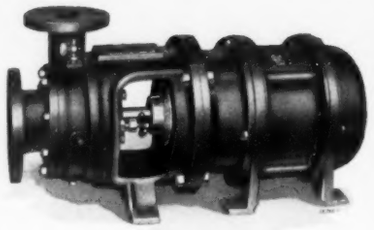
Model B-2-2750 electric furnace developed by Duncan Mackenzie's Sons Co. Inc.

self-locking to maintain size. A turn of one notch to the adjusting screw gives a diametrical movement of the chasers amounting to 0.001 inch.

♦ ♦ ♦

High Temperature Furnace—

Duncan Mackenzie's Sons Co., Inc., Trenton, N. J., is introducing an electric furnace designed for laboratory and industrial use where working temperatures up to 2750 degrees Fahr. are required. The unit, shown herewith, is equipped with newly developed heating elements that are claimed to be practically immune to oxidation. The two elements are mounted through the side walls in a horizontal position from side to side of the heating chamber, being located



Ingersoll-Rand motorpump

near the ceiling. They are suitable for use in either reducing or oxidizing atmospheres. Transformers are furnished for voltage control and a standard ammeter is supplied.

♦ ♦ ♦

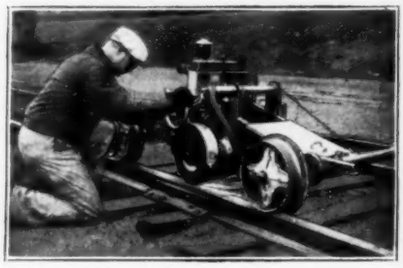
Motorpump—

Ingersoll-Rand Co., Phillipsburg, N. J., is announcing a motorpump which requires little space since a Cameron pump and a G-E motor are built together as one unit on a single shaft. It can be mounted in any position, bolted to the floor or wall or to equipment. This motorpump, shown herewith, is finding wide application in the air conditioning field. The suction entrance is on the end with liquid entering directly into the eye of the impeller.

♦ ♦ ♦

Rail Grinder—

Mall Tool Co., 7740 South Chicago avenue, Chicago, is marketing a



Mall heavy-duty rail grinder

heavy-duty all-purpose rail grinder, shown herewith. Power takeoff is provided for quickly attaching a flexible shaft drive and spindle for free-hand surface grinding, switch point grinding and rail end cross slotting. A positive precision toggle

BUILT BY MORGAN *Engineering* » »

MANY of the gigantic machines used in industry do not bear our name, but their largest parts are often made and finished in our machine shops—part of our plants with a floor area of approximately 700,000 square feet. Energy Absorbers for Boulder Dam were machined here. Our machine shops are equipped to handle pieces of machinery as large as it is possible to transport by rail. Facilities include brass foundries, heavy forging plant, structural steel fabricating plant, light and heavy machine shops, erecting rooms, power plant, chemical and physical testing laboratories, and a complete engineering and manufacturing organization. One end of our heavy machine shops is shown here.

THE MORGAN ENGINEERING CO., Alliance, Ohio
Pittsburgh, 1420 Oliver Bldg. New York, 11 W. 42nd Street
Designers and Manufacturers of ELECTRIC TRAVELING CRANES
ROLLING MILL MACHINERY • SPECIAL MACHINERY FOR STEEL MILLS

grinding wheel feed is provided, which can be adjusted to a grinding accuracy of 0.003 to 0.005 inch. An ajustable pivot turning device facilitates a quick change of grinding work on either rail.

♦ ♦ ♦

Gear Speeder—

Michigan Tool Co., Detroit, is announcing a new gear speeder designed to closely simulate operating conditions in the testing of gears for

Michigan gear speeder for routine checking of gears

quietness. Pairs of production gears can be run together both forward and reverse, under loads, while being checked. The machine, shown herewith, handles gears up to 14 inches in length on the rear and up to 17 inches in length on the front spindle, thus accommodating the largest of gear clusters. Both spindles are provided with a 1½-inch hole to receive shanks of stem gears. The unit is particularly adaptable to routine checking of gears in regular production.

♦ ♦ ♦

Floor Truck—

Lewis-Shepard Co., Watertown station, Boston, is offering a No. 1595 "Q" type floor truck with a one-piece

Lewis-Shepard floor truck

steel frame are welded throughout. Other features include smooth flush steel bound hardwood top, industrial balloon tires, etc. Antifriction bearings are used in the wheels and casters. Steel end protection and rugged corner construction also are provided.

♦ ♦ ♦

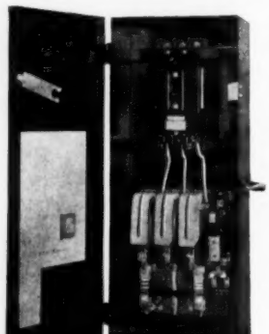
Combination Magnetic Switches—

General Electric Co., Schenectady, N. Y., is introducing a new line of combination magnetic switches with maximum ratings of 25 horsepower at 220 volts and 50 horsepower at 440 volts to 600 volts parallels. In these new switches, one of which is shown herewith, air circuit breakers which can be reset by hand after tripping are used. Breaker operating handle is interlocked with the enclosing case door so that it cannot be opened when the breaker is closed and the breaker can be locked either open or closed from the outside of the case.

♦ ♦ ♦

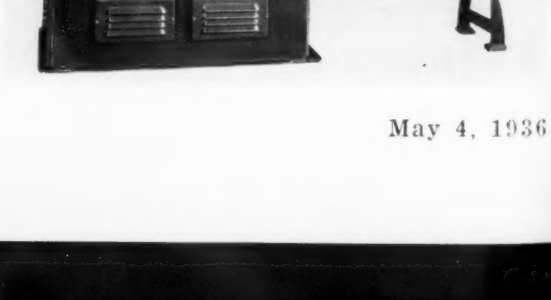
Automatic Wire Straightening And Cutting Machine—

Lewis Machine Co., 1592-1600 East Twenty-fourth street, Cleveland, is bringing out a flying shear automatic wire straightening and cutting machine which feeds the wire from the coil, straightens, gages to accurate length and cuts on the fly. The cutoff head drive is designed to permit low head construction, elim-



G-E combination magnetic switch

inating any tendency to rock at the end of the stroke or produce uneven wear on the head or bed ways. A roll straightener is provided to remove the coil bow and rough straighten the wire before it enters the rotary straightener arbor or flier.



ALL cutoff drive mechanism of this Lewis wire straightening and cutting machine is sealed in the machine bed

Procunier tapping attachment

A standard five-die steel rotary straightener is used for the finish straightening operation, being designed to take hardened iron, bronze, babbitt or any type of straightener die best suited for the wire to be handled. It particularly meets the requirements for precision work on bright finished steel, bronze, aluminum and alloy wire. New type extension support brackets are mounted on a rigid steel base extending from the machine base the full length of the extension. The wire brackets are constructed to hold the cut lengths away from the machine, shown herewith, so that they can be removed readily without interfering with operation.

♦ ♦ ♦

Tapping Attachment—

Procunier Safety Chuck Co., 12-14 South Clinton street, Chicago, is bringing out a high-speed friction tapping attachment, shown herewith, that is equipped with a new type of tap holder claimed to considerably increase tapping accuracy. Weight of the new tap holder is only 2½ ounces, including the spring collet and chuck spindle. Mechanism in the tapping attachment is enclosed in an aluminum housing. The new device has a capacity of No. 2 tap to 3/16 inch in steel and ¼ inch in brass and cast iron. Wrenches for locking and loosening taps, together with a set of four collets are furnished with each tapping attachment.

Markets Resist Unsettling Factors; Rate Steady

Scrap Easiness Spreads; 17 Blast Furnaces Relighted in April

MARKET IN TABLOID

DEMAND . . . . *Strong.*

PRICES . . . *Iron, steel firm; scrap easier.*

PRODUCTION . . . *Steelworks operations unchanged at 69½ per cent.*

SHIPMENTS . . . *Steady.*

AFTER four months of the highest steelworks operations since the spring of 1930—four months in which the industry has averaged about 58 per cent—and despite the unsettling factors of an approaching national political campaign, impending tax legislation, and the stock market break, iron and steel demand continues to exhibit a surprising degree of vitality.

Although the general decline in scrap buying and in scrap prices over the past two weeks also has created some uncertainty in the market, the general tone so far is one of steadiness, and steelmakers believe this will extend through the greater part of this month.

Last week there was a mild revival in purchasing of automobile material, and a still more notable spread in miscellaneous consumer orders. New specifications were in sufficient volume to replace most of the current shipments, and the steel rate held at 69½ per cent.

Following nine consecutive weekly gains automobile assemblies turned down slightly, 118,700 units comparing with the peak of 120,500 in the preceding week. April output topped 500,000 cars, the fifth largest month in the industry's history; only in March, April, May and June, 1929, were more cars produced. Much of the steel industry's hopes for May are based on predictions at Detroit that assemblies this month will be close to the April total.

Private construction work, though heavier, still fails to offset the lack of large public works projects such as featured the structural market in spring months in recent years, and shape awards in the week amounted only to 14,884 tons. Authorization by the Union Carbide Co., New York, of a $20,000,000 plant expansion program, is expected to require a large volume of structural steel.

Three pipe lines also promise to develop substantial steel requirements shortly. Largest of these is a 360-mile line from Muskegon, Mich., to the Ohio river for the Old Dutch Refining Co., Muskegon. Continental Oil Co., Ponca City, Okla., has awarded a 79-mile welded line in western Kansas; and the Kentucky Natural Gas Corp., Kansas City, Mo., a 24-mile line between Terre Haute and Montezuma, Ind.

River barges awarded last week at Pittsburgh, or on which bids were taken, call for 5400 tons of plates and shapes. For tunnel liners at the Fort Peck ,Mont., dam 7400 tons of plates were placed with a Chicago fabricator.

Nickel Plate railroad awarded 777 freight cars, while Northern Pacific entered the market for 750 cars. Rail purchases, which have been tapering recently, totaled 8360 tons.

Merchant pig iron shipments in April were about 10 per cent less than in March. Pittsburgh blast furnaces are inquiring for a considerable tonnage of beehive coke rather than starting up more by-product coke ovens. Steelworks are well stocked with scrap, and STEEL's scrap composite has dropped 41 cents to $13.92.

Daily average pig iron production in April, 80,403 gross tons, was 21.8 per cent over March, while the month's total, 2,412,080 tons, was up 17.9 per cent. Output in the first four months this year, 8,326,437 tons, was 27.5 per cent heavier than in 1935. A net gain of 17 blast furnaces in April brought the total number operating at the close of the month to 143, largest since July, 1930.

Steel ingot production figures for April, when they become available this week, will show about a 15 per cent gain over March. For ingots, the increase in the first four months this year over the corresponding period in 1935 is 18 per cent.

Steelworks operations in the eastern Pennsylvania district last week advanced ½-point to 44½ per cent; New England, 3 to 78; Chicago, ½ to 71. Youngstown was off 1 to 78, while others were unchanged.

STEEL's iron and steel price composite is down 8 cents to $33; the finished steel index remains $52.20.

COMPOSITE MARKET AVERAGES

	May 2	April 25	April 18	One Month Ago April, 1936	Three Months Ago Feb., 1936	One Year Ago May, 1935	Five Years Ago May, 1931
Iron and Steel	$33.00	$33.08	$33.09	$33.10	$33.48	$32.35	$31.07
Finished Steel	52.20	52.20	52.20	52.20	53.70	54.00	49.02
Steelworks Scrap	13.92	14.33	14.37	14.39	13.83	10.27	9.31

Iron and Steel Composite:—Pig iron, scrap, billets, sheet bars, wire rods, tin plate, wire, sheets, plates, shapes, bars, black pipe, rails, alloy steel hot strip, and cast iron pipe at representative centers. Finished Steel Composite:—Plates, shapes, bars, hot strip, nails, tin plate, pipe. Steelworks Scrap Composite:—Heavy melting steel and compressed sheets.

A COMPARISON OF PRICES

Representative Market Figures for Current Week; Average for Last Month, Three Months and One Year Ago

Finished Material

	May 2, 1936	April 1936	Feb. 1936	May 1935
Steel bars, Pittsburgh	1.85c	1.85c	1.85c	1.80c
Steel bars, Chicago	1.90	1.90	1.90	1.85
Steel bars, Philadelphia	2.16	2.11	2.16	2.11
Iron bars, Terre Haute, Ind.	1.75	1.75	1.75	1.75
Shapes, Pittsburgh	1.80	1.80	1.80	1.80
Shapes, Philadelphia	2.01½	2.01½	2.01½	2.01½
Shapes, Chicago	1.85	1.85	1.85	1.85
Tank plates, Pittsburgh	1.80	1.80	1.80	1.80
Tank plates, Philadelphia	2.00	1.99	1.99	1.99
Tank plates, Chicago	1.85	1.85	1.85	1.85
Sheets, No. 10, hot rolled, Pitts.	1.85	1.85	1.85	1.85
Sheets, No. 24, hot ann., Pitts.	2.40	2.40	2.40	2.40
Sheets, No. 24, galv., Pitts.	3.10	3.10	3.10	3.10
Sheets, No. 10, hot rolled, Gary	1.95	1.95	1.95	1.95
Sheets, No. 24, hot anneal., Gary	2.50	2.50	2.50	2.55
Sheets, No. 24, galvan., Gary	3.20	3.20	3.20	3.20
Plain wire, Pittsburgh	2.40	2.40	2.30	2.30
Tin plate, per base box, Pitts.	5.25	5.25	5.25	5.25
Wire nails, Pitts.	2.10	2.10	2.40	2.60

Semifinished Material

Sheet bars, open-hearth, Youngs.	$28.00	28.00	30.00	28.00
Sheet bars, open-hearth, Pitts.	28.00	28.00	30.00	28.00
Billets, open-hearth, Pittsburgh	28.00	28.00	29.00	27.00
Wire rods, Pittsburgh	40.00	40.00	40.00	38.00

Pig Iron

	May 2, 1936	April 1936	Feb. 1936	May 1935
Bessemer, del. Pittsburgh	$20.8132	20.8132	20.8132	19.80
Basic, Valley	19.00	19.00	19.00	18.00
Basic, eastern del. East. Pa.	20.8132	20.8132	20.8132	19.81
No. 2 fdy., del. Pittsburgh	20.3132	20.3132	20.3132	19.30
No. 2 fdy., Chicago	19.50	19.50	19.50	18.50
Southern No. 2, Birmingham	15.50	15.50	15.50	14.50
Southern No. 2, del. Cincinnati	20.2007	20.2007	20.2007	19.38
No. 2X eastern, del. Phila.	21.6882	21.6882	21.6882	20.68
Malleable, Valley	19.50	19.50	19.50	18.50
Malleable, Chicago	19.50	19.50	19.50	18.50
Lake Sup., charcoal, del. Chicago	25.2528	25.2528	25.2528	24.25
Ferromanganese, del. Pitts.	80.13	80.13	80.13	90.13
Gray forge, del. Pittsburgh	19.6741	19.6741	19.6741	18.66

Scrap

Heavy melting steel, Pittsburgh	$15.00	15.75	14.80	12.00
Heavy melt. steel, No. 2, east. Pa.	12.25	12.70	12.00	9.25
Heavy melting steel, Chicago	14.25	14.35	14.30	10.20
Rail for rolling, Chicago	15.75	15.75	15.50	11.05
Railroad steel specialties, Chicago	15.75	15.85	15.75	11.40

Coke

Connellsville, furnace, ovens	$3.50	3.50	3.50	3.60
Connellsville, foundry, ovens	4.25	4.25	4.20	4.60
Chicago, by-product foundry, del.	9.75	9.75	9.75	9.25

Steel, Iron, Raw Material, Fuel and Metals Prices

Except when otherwise designated, prices are base, f.o.b. cars. Asterisk denotes price change this week.

Sheet Steel

Prices Subject to Quantity Extras and Deductions

Hot Rolled No. 10, 24-48 in.

Pittsburgh	1.85c
Gary	1.95c
Chicago, delivered	1.98c
Detroit, del.	2.05c
New York, del.	2.20c
Philadelphia, del.	2.16c
Birmingham	2.00c
St. Louis, del.	2.18c
Pacific ports, f.o.b. cars, dock	2.40c

Hot Rolled Annealed No. 24

Pittsburgh	2.40c
Gary	2.50c
Chicago, delivered	2.53c
Detroit, delivered	2.60c
New York, del.	2.75c
Philadelphia, del.	2.71c
Birmingham	2.55c
St. Louis, del.	2.72c
Pacific ports, f.o.b. cars, dock	3.05c

Galvanized No. 24

Pittsburgh	3.10c
Gary	3.20c
Chicago, delivered	3.23c
Philadelphia, del.	3.41c
New York, del.	3.45c
Birmingham	3.25c
St. Louis, del.	3.43c
Pacific ports, f.o.b. cars, dock	3.70c

Tin Mill Black No. 28

Pittsburgh	2.75c
Gary	2.85c
St. Louis, delivered	3.08c

Cold Rolled No. 10

Pittsburgh	2.50c
Gary	2.60c
Detroit, delivered	2.70c
Philadelphia, del.	2.81c
New York, del.	2.85c
Pacific ports, f.o.b. cars, dock	3.10c

Cold Rolled No. 20

Pittsburgh	2.95c
Gary	3.05c
Detroit, delivered	3.15c
Philadelphia, del.	3.26c
New York, del.	3.30c

Enameling Sheets

Pittsburgh, No. 10	2.35c
Pittsburgh, No. 20	2.95c
Gary, No. 10	2.45c
Gary, No. 20	3.05c

Tin and Terne Plate

Gary base, 10 cents higher.

Tin plate, coke base (box) Pittsburgh	$5.25
Do., waste-waste	2.75c
Do., strips	2.50c
Long ternes, No. 24 unassorted, Pitts.	3.40c
Do., Gary	3.50c

Corrosion and Heat-Resistant Alloys

Pittsburgh base, cents per lb.

Chrome-Nickel

	No. 302	No. 304
Bars	23.00	24.00
Plates	26.00	28.00
Sheets	33.00	35.00
Hot strip	20.75	22.75
Cold strip	27.00	29.00

Straight Chromes

	No. 410	No. 430	No. 442	No. 446
Bars	17.00	18.50	21.00	26.00
Plates	20.00	21.50	24.00	29.00
Sheets	25.00	28.00	31.00	35.00
Hot strip	15.75	16.75	21.75	26.75
Cold stp	20.50	22.00	27.00	35.00

Steel Plates

Pittsburgh	1.80c
New York, del.	2.09c
Philadelphia, del.	1.99c
Boston, delivered	2.22c
Buffalo, delivered	2.05c
Chicago or Gary	1.85c
Cleveland, del.	1.99½c
Birmingham	1.95c
Coatesville, base	1.90c
Sparrows Pt., base	1.90c
Pacific ports, f.o.b. cars, dock	2.35c
St. Louis, delivered	2.08c

Structural Shapes

Pittsburgh	1.80c
Philadelphia, del.	2.01½c
New York, del.	2.06½
Boston, delivered	2.20½c
Bethlehem	1.90c
Chicago	1.85c
Cleveland, del.	2.00c
Buffalo	1.90c
Gulf Ports	2.20c
Birmingham	1.95c
Pacific ports, f.o.b. cars, dock	2.35c

Bars

Soft Steel
(Base, 3 to 25 tons)

Pittsburgh	1.85c
Chicago or Gary	1.90c
Duluth	2.00c
Birmingham	2.00c
Cleveland	1.90c
Buffalo	1.95c
Detroit, delivered	2.00c
Pacific ports, f.o.b. cars, dock	2.40c
Philadelphia, del.	2.16c
Boston, delivered	2.27c
New York, del.	2.20c
Pitts., forg. qual.	2.10c

Rail Steel
To Manufacturing Trade

Pittsburgh	1.70c
Chicago or Gary	1.75c
Moline, Ill.	1.75c
Cleveland	1.75c
Buffalo	1.80c

Iron

Troy, N. Y.	1.70c
Terre Haute, Ind.	1.75c
Chicago	1.80c
Philadelphia	2.06c
Pittsburgh, refined	2.75-7.50c

Reinforcing

New billet, straight lengths, quoted by distributors.

Pittsburgh	1.95c-2.05c
Chicago, Gary, Buffalo, Cleve., Birm., Young.	2.10c
Gulf ports	2.45c
Pacific coast ports f.o.b. car docks	2.45c
Philadelphia, del.	2.11c-2.16c

Rail steel, straight lengths, quoted by distributors

Pittsburgh	1.90c
Chicago, Buffalo, Cleveland, Birm., Young.	1.95c
Gulf ports	2.30c

Wire Products

(Base, 3 to 25 tons)

(Prices apply to straight or mixed carloads; less carloads $4 higher; less carloads fencing $5 over base column.)

Base Pitts.-Cleve. 100 lb. keg.	
Stand. wire nails	2.10c
Cement c't'd nails	2.10c
Galv. nails, 15 gage and finer	4.10c
do. finer than 15 ga.	4.60c

(Per pound)

Polished staples	2.80c
Galv. fence staples	3.05c
Barbed wire, galv.	2.60c
Annealed fence wire	2.65c
Galv. fence wire	3.00c
Woven wire fencing (base column, c.l.)	$58.00

To Manufacturing Trade

Plain wire, 6-9 ga.	2.40c

Anderson, Ind. (merchant products only) and Chicago up $1; Duluth up $2; Birmingham up $3.

Spring wire, Pitts. or Cleveland	3.05c

Do., Chicago up $1, Worc. $2.

Cold-Finished Carbon Bars and Shafting

Base, Pitts., one size, shape, grade, shipment at one time to one destination

10,000 to 19,999 lbs.	2.10c
20,000 to 59,999 lbs.	2.05c
60,000 to 99,999 lbs.	2.00c
100,000 lbs. and over	1.97½c

Gary, Ind., Cleve., Chi., up 5c Buffalo, up 10c; Detroit, up 20c; eastern Michigan, up 25c

Alloy Steel Bars (Hot)

(*Base, 3 to 25 tons.*)

Pittsburgh, Buffalo, Chicago, Massilon, Canton, Bethlehem 2.45c

Alloy S.A.E.	Diff.	Alloy S.A.E.	Diff.
2000	0.25	3100	0.55
2100	0.55	3200	1.35
2300	1.50	3300	3.80
2500	2.25	3400	3.20

4100 0.15 to 0.25 Mo. 0.50
4600 0.20 to 0.30 Mo. 1.25-1.75 Ni 1.05
5100 0.80-1.10 Cr 0.45
5100 Cr. spring base
6100 bars 1.20
6100 spring 0.70
Cr., Ni., Van. 1.50
Carbon Van. 0.95
9200 spring flats base
9200 spring rounds, squares 0.25

Piling

Pittsburgh	2.15c
Chicago, Buffalo	2.25c

Strip and Hoops

(Base, hot rolled, 25-1 ton)
(Base, cold-rolled, 25-3 tons)

Hot strip to 23⅞-in. Pittsburgh	1.85c
Chicago or Gary	1.95c
Birmingham base	2.00c
Detroit, del.	2.05c
Philadelphia, del.	2.16c
New York, del.	2.20c
Cooperage hoop, Pittsburgh	1.95c
Chicago	2.05c
Cold strip, 0.25 carbon and under, Pitts., Cleveland	2.60c
Detroit, del.	2.81c
Worcester, Mass.	2.80c

Rails, Track Material

(Gross Tons)

Standard rails, mill	$36.37½
Relay rails, Pitts.	
20-45 lbs.	$28.00
45-50 lbs.	$25.00
50-60 lbs.	$26.00
70-75 lbs.	$24.50
80-90 lbs.	$26.00
100 lbs.	$27.00
Light rails, billet qual. Pitts., Chi.	$35.00
Do., reroll, qual.	34.00
Angle bars, billet, Gary, Ind., So. Chi.	2.55c
Do., axle steel	2.10c
Spikes, R. R. base	2.60c
Track bolts, base	3.60c
Tie plates, base	1.90c

Base, light rails 25 to 40 lbs.; 50 to 60 lbs. inclusive up $2; 16 and 20 lbs., up $1; 12 lbs. up $2; 8 and 10 lbs., up $5. Base railroad spikes 200 kegs or more; base tie plates 20 tons.

Bolts and Nuts

Pittsburgh, Cleveland, Birmingham, Chicago. Discounts to legitimate trade as per Dec. 1, 1932 lists:

Carriage and Machine

½ x 6 and smaller	70-10-5 off
Do. larger	70-10 off
Tire bolts	55 off

Plow Bolts

All sizes	70-10 off

Stove Bolts

*In packages with nuts attached 72½-10-10 off; in packages with nuts separate 72½-10-10-5 off; in bulk 82½ off on 15,000 of 3-inch and shorter, or 5000 over 3-inch.

Step bolts	65-5 off
Elevator bolts	65-5 off

Nuts

S. A. E. semifinished hex.; ½ to ⅞-inch	60-20-15 off
Do., ½ to 1-inch	60-20-15 off
Do., over 1-inch	60-20-15 off

Hexagon Cap Screws

Milled	80-10-10 off
Upset, 1-in., smaller	85 off

Square Head Set Screws

Upset, 1-in., smaller	75-10 off
Headless set screws	75 off

Rivets, Wrought Washers

Struc., c. l., Pittsburgh, Cleveland	2.90c
Struc., c. l., Chicago	3.00c
⅞-in. and smaller, Pitts., Chi., Cleve.	70 and 5 off
Wrought washers, Pitts., Chi., Phila. to jobbers & large nut, bolt mfrs.	$6.25 off

Cut Nails

Cut nails, Pitts.; (10% discount on size extras)	$2.75
Do. less carloads, 5 kegs or more, no discount on size extras	$3.05
Do., under 5 kegs; no disc. on size extras	$3.20

Pipe and Tubing

Base $200 net ton, except on standard commercial seamless boiler tubes under 2 inches and cold drawn seamless tubing.

Welded Iron, Steel Pipe

Base discounts on steel pipe, Pitts., Lorain, O., to consumers in carloads. Gary, Ind., 2 points less. Chicago, del. 2½ points less. Wrought pipe, Pittsburgh.

Butt Weld

In.	Blk.	Galv.
Steel		
¼ and ⅜	60	44½
½	64½	55
¾	67½	59
1—3	69½	61½
Iron		
½	31½	15
¾	36½	20½
1—1¼	39½	25½
2	41½	26

Lap Weld

Steel		
2	62	53½
2½—3	65	56½
3½—6	67	58½
7 and 8	66	56½
9 and 10	65½	56
Iron		
2	37	22½
2½—3½	38	25
4—8	40	28½

Line Pipe

Steel	
⅛, butt weld	56
¼ and ⅜, butt weld	59
½, butt weld	63½
¾, butt weld	66½
1 to 3, butt weld	68½
2, lap weld	61
2½ to 3, lap weld	64
3½ to 6, lap weld	66
7 and 8, lap weld	65
Iron	

⅛—1½ inch, black and galv. take 4 pts. over; 2½—6 inch 2 pts. over discounts for same sizes, standard pipe lists, 8—12-inch, no extra.

Boiler Tubes

C. L. Discounts, f.o.b. Pitts. *Lap Weld Steel*		*Charcoal Iron*	
2—2¼	33	1¾	8
2½—2¾	40	2—2¼	13
3	47	2½—2¾	16
3¼—3½	50	3	17
4	52	3¼—3½	18
4½—5	42	4	20
		4½	21

In lots of a carload or more, above discounts subject to preferential of two 5% and one 7½% discount on steel and 10% on charcoal iron.

Lapwelded steel: 200 to 9999 pounds, ten points under base, one 5% and one 7½%. Under 2000 pounds 15 points under base, one 5% and one 7½%. Charcoal iron: 10,000 pounds to carloads, base less 5%; under 10,000 lbs., 2 points under base.

Seamless Boiler Tubes

Under date of May 15 in lots of 40,000 pounds or more for cold-drawn boiler tubes and in lots of 40,000 pounds or feet or more for hot-finished boiler tubes, revised prices are quoted for 55 cold-drawn boiler tube sizes ranging from ¼ to 6-inch outside diameter in 30 wall thicknesses, decimal equivalent from 0.035 to 1.000, on a dollars and cents basis per 100 feet and per pound. Less-carloads revised as of July 1, 1935, card.

Hot-finished carbon steel boiler tube prices also under date of May 15 range from 1 through 7 inches outside diameter, inclusive, and embrace 47 size classifications in 22 decimal wall thicknesses ranging from 0.109 to 1.000, prices also being on a lb. and 100 ft. basis.

Seamless Tubing

Cold drawn; f.o.b. mill disc.

100 ft. or 150 lbs.	32%
15,000 ft. or 22,500 lbs.	70%

Cast Iron Water Pipe

Class B Pipe—Per Net Ton

6-in. & over, Birm.	$39.00-40.00
4-in., Birmingham	42.00-43.00
4-in., Chicago	50.40-51.40
6 to 24-in. Chicago	47.40-48.40
6-in. & over, east. fdy.	43.00
Do., 4 in.	46.00

Class A pipe $3 over Class B Stnd. fitgs., Birm. base $100.00

Semifinished Steel

Billets and Blooms

4 x 4-inch base; gross ton

Pitts., Chi., Cleve., Buffalo & Youngstown	$28.00
Philadelphia	34.67
Duluth	30.00

Forging Billets

6 x 6 to 9 x 9-in., base

Pitts., Chi., Buff.	35.00
Forging, Duluth	37.00

Sheet Bars

Pitts., Cleve., Young., Chi., Buff., Canton, Sparrows Pt.	28.00

Slabs

Pitts., Chi., Cleve., Young.	28.00

Wire Rods

Pitts., Cleve., No. 4 to 5	$38.00
Do., No. 5 to 15/32-inch	40.00
Do., over 15/32 to 47/64-inch	42.00

Chicago up $1; Worcester up $2

Skelp

Pitts., Chi., Young., Buff., Coatesville, Sparrows Point	1.80c

Coke

Price Per Net Ton

Beehive Ovens

Connellsville, fur.	$3.50- 3.65
Connellsville, fdry.	4.25- 4.35
Connel. prem. fdry.	5.35- 5.50
New River fdry.	6.00
Wise county fdry.	4.45- 5.00
Wise county fur.	4.00- 4.50

By-Product Foundry

Newark, N. J., del.	9.70-10.15
Chi., ov., outside del.	9.00
Chicago, del.	9.75
New England, del.	11.50
St. Louis, del.	10.00-10.50
Birmingham, ovens	6.50
Indianapolis, del.	9.40
Cincinnati, del.	9.50
Cleveland, del.	9.75
Buffalo, ovens	7.50- 8.00
Detroit, ov., out. del	9.00
Philadelphia, del.	9.38

Coke By-Products

Per gallon, producers' plants.

	Tank lots	Spot
Pure and 90% benzol		18.00c
Toluol		30.00c
Solvent naphtha		30.00c
Industrial xylol		30.00c

Per lb. f.o.b. New York.

Phenol (200 lb. drums)	16.30c
Do. (100 lbs.)	17.30c

Eastern Plants, per lb.

Naphthalene flakes and balls, in bbls., to jobbers	7.25c

Per 100 lb. Atlantic seaboard

Sulphate of ammonia	$1.30

†Western prices, ½-cent up.

Pig Iron

Delivered prices include switching charges only as noted. No. 2 foundry is 1.75-2.25 sil.; 25c diff. for each 0.25 sil. above 2.25; 50c diff. for each 0.25 below 1.75. Gross tons.

Basing Points:	No. 2 Fdry	Malleable	Basic	Bessemer
Bethlehem, Pa.	$20.50	$21.00	$20.00	$21.50
Birdsboro, Pa.	20.50	21.00	20.00	21.50
Birmingham, Ala., southern del.	15.50	15.50	14.50	21.00
Buffalo	19.50	20.00	18.50	20.50
Chicago	19.50	19.50	19.00	20.00
Cleveland	19.50	19.50	19.00	20.00
Detroit	19.50	19.50	19.00	20.00
Duluth	20.00	20.00	.....	20.50
Erie, Pa.	19.50	20.00	19.00	20.50
Everett, Mass.	20.50	21.00	20.00	21.50
Hamilton, O.	19.50	19.50	19.00	.....
Jackson, O.	20.25	20.25	19.75	.....
Neville Island, Pa.	19.50	19.50	19.00	20.00
Provo, Utah	17.50	.....	17.00	.....
Sharpsville, Pa.	19.50	19.50	19.00	20.00
Sparrows Point, Md.	20.50	.....	20.00	.....
Swedeland, Pa.	20.50	21.00	20.00	21.50
Toledo, O.	19.50	19.50	19.00	20.00
Youngstown, O.	19.50	19.50	19.00	20.00
Delivered from Basing Points:				
Akron, O., from Cleveland	20.76	20.76	26.26	21.26
Baltimore from Birmingham	21.08	.....	19.96	.....
Boston from Birmingham	20.62	.....	20.50	.....
Boston from Everett, Mass.	21.00	21.50	20.50	22.00
Boston from Buffalo	21.00	21.50	20.50	22.00
Brooklyn, N. Y., from Bethlehem	22.93	23.43	.....	.....
Brooklyn, N. Y., from Bmghm.	22.50	.....	.....	.....
Canton, O., from Cleveland	20.76	20.76	20.26	21.26
Chicago from Birmingham	†19.72	.....	19.60	.....
Cincinnati from Hamilton, O.	20.58	20.58	20.08	.....
Cincinnati from Birmingham	20.20	.....	19.20	.....
Cleveland from Birmingham	19.62	.....	19.12	.....
Indianapolis from Hamilton, O.	21.93	21.93	21.43	22.43
Mansfield, O., from Toledo, O.	21.26	21.26	20.76	21.76
Milwaukee from Chicago	20.57	20.57	20.07	21.07
Muskegon, Mich., from Chicago Toledo or Detroit	22.60	22.60	22.10	23.10
Newark, N. J., from Birmingham	21.61	.....	.....	.....
Newark, N. J., from Bethlehem	21.99	22.49	.....	.....
Philadelphia from Birmingham	20.93	.....	20.81	.....
Philadelphia from Swedeland, Pa.	21.31	21.81	20.81	.....
Pittsburgh district from Neville Island	Neville base plus 67c, 81c and $1.21 switching charges			
Saginaw, Mich., from Detroit	21.75	21.75	21.25	21.25

Delivered from Basing Points:	No. 2 Fdry	Malleable	Basic	Bessemer
St. Louis, northern	20.00	20.00	19.50	.....
St. Louis from Birmingham	†19.62	.....	19.50	.....
St. Paul from Duluth	21.94	21.94	.....	22.44

†Over 0.70 phos.

Low Phos.

Basing Points: Birdsboro and Steelton, Pa., and Standish, N. Y., $24.00, Phila. base, standard and copper bearing, $25.13.

Gray Forge		Charcoal	
Valley furnace	19.00	Lake Superior fur.	$22.00
Pitts. dist. fur.	19.00	Do., del. Chicago	25.25
		Lylees, Tenn.	22.50

Silvery†

Jackson county, O., base; 6-6.50 per cent $22.75; 6.51-7—$23.25; 7-7.50—$23.75; 7.51-8—$24.25; 8-8.50—$24.75; 8.51-9—$25.25; 9-9.50—$25.75. Buffalo $1.25 higher.

Bessemer Ferrosilicon†

Jackson county, O., base: Prices are the same as for silveries, plus $1 a ton.

†The lower all-rail delivered price from Jackson, O., or Buffalo is quoted with freight allowed.

Manganese differentials in silvery iron and ferrosilicon. 2 to 3%, $1 per ton add. Each unit over 3%, add $1 per ton.

Refractories

Per 1000 f.o.b. Works

Fire Clay Brick

Super Quality

Pa., Mo., Ky.	$55.00

First Quality

Pa., Ill., Md., Mo., Ky.	$45.00
Alabama, Ga.,	$38.00-45.00

Second Quality

Pa., Ill., Ky., Md., Mo.	40.00
Ga., Ala.	35.00

Ohio

First quality	$40.00
Intermediary	37.00
Second quality	28.00

Malleable Bung Brick

All bases	50.00

Silica Brick

Pennsylvania	$45.00
Joliet, E. Chicago	54.00
Birmingham, Ala.	48.00

Magnesite

Imported dead-burned grains, net ton f.o.b. Chester, Pa., and Baltimore bases (bags)	$45.00
Domestic dead-burned grains, net ton f.o.b. Chester, Pa., and Baltimore bases (bags)	40.00
Domestic dead-burned gr. net ton f.o.b. Chewelah, Wash. (bulk)	22.00

Basic Brick

Net ton, f.o.b. Baltimore, Plymouth Meeting, Chester, Pa.

Chrome brick	$45.00
Chemically bonded chrome brick	45.00
Magnesite brick	65.00
Chemically bonded magnesite brick	55.00

Fluorspar, 85-5

Washed gravel, duty paid, tide, net ton	$20.50
Washed gravel, f.o.b. Ill., Ky., net ton, carloads, all-rail	$18.00
Do., for barge	$19.00

Ferroalloys

Dollars, except Ferrochrome

Ferromanganese, 78-82% tidewater, duty paid	75.00
Do., Balti., base	75.00
Do., del. Pittsb'gh	80.13
Spiegeleisen, 19-20% dom. Palmerton, Pa., spot†	26.00
Do., New Orleans	26.00
*Ferrosilicon, 50% freight all., cl.	69.50
Do., less carload	77.00
Do., 75 per cent	126-130.00
Spot, $5 a ton higher.	
Silicoman., 2½ carb.	85.00
2% carbon, 90.00; 1%,	100.00
Ferrochrome, 66-70 chromium, 4-6 carbon, cts. lb. del.	10.00
Ferrotungsten, stand., lb. con. del.	1.30- 1.40
Ferrovanadium, 35 to 40% lb., cont.	2.70- 2.90
Ferrotitanium, c. l., prod. plant, frt. allow., net ton	137.50
Spot, 1 ton, frt. allow., lb.	7.00
Do., under 1 ton	7.50
Ferrophosphorus, per ton, c. l., 17-19% Rockdale, Tenn., basis, 18%, $3 unitage	58.50
Ferrophosphorus, electrolytic, per ton c. l., 23-26% f.o.b. Anniston, Ala., 24% $3 unitage	75.00
Ferromolybdenum, stand. 55-65%, lb.	0.95
Molybdate, lb. cont.	0.80

†Carloads, Quan. diff. apply

Nonferrous

METAL PRICES OF THE WEEK

Spot unless otherwise specified. Cents per pound

	Copper: Electro, del. Conn.	Copper: Lake, del. Midwest	Copper: Casting, refinery	Straits Tin: New York Spot	Straits Tin: New York Futures	Lead: N. Y.	Lead: East St. L.	Zinc: St. L.	Aluminum 99%	Antimony: Chinese Spot, N. Y.	Nickel: Cathodes
Apr. 25	9.50	9.62½	9.12½	46.62½	45.75	4.60	4.45	4.90	*19.00	13.50	35.00
Apr. 27	9.50	9.62½	9.12½	46.70	45.80	4.60	4.45	4.90	*19.00	13.50	35.00
Apr. 28	9.50	9.62½	9.12½	46.70	45.87½	4.60	4.45	4.90	*19.00	13.50	35.00
Apr. 29	9.50	9.62½	9.12½	46.60	45.75	4.60	4.45	4.90	*19.00	13.50	35.00
Apr. 30	9.50	9.62½	9.12½	46.62½	45.62½	4.60	4.45	4.90	*19.00	13.50	35.00
May 1	9.50	9.62½	8.12½	47.00	45.60	4.60	4.45	4.90	*19.00	13.50	35.00

*Nominal range 19.00 to 21.00c.

MILL PRODUCTS

F.o.b. mill base, cents per lb. except as specified. Copper brass products based on 9.00c Conn. copper.

Sheets	
Yellow brass (high)	14.87½
Copper, hot rolled	16.75
Lead cut to jobers	8.25
Zinc, 100-lb. base	9.50
Tubes	
High yellow brass	17.37½
Seamless copper	17.50
Rods	
High yellow brass	13.12½
Copper, hot rolled	13.75
Anodes	
Copper, untrimmed	14.25
Wire	
Yellow brass (high)	15.37½

OLD METALS

Deal. buying prices, cents lb.

No. 1 Composition Red Brass	
*New York	6.25- 6.50
Cleveland	6.75- 7.00
*Chicago	6.00- 6.25
St. Louis	6.00- 6.50
Heavy Copper and Wire	
*New York, No. 1	7.75- 8.00
*Chicago, No. 1	7.00- 7.50
Cleveland	7.00- 7.25
St. Louis, No. 1	7.25- 7.75
Composition Brass Borings	
*New York	5.87½- 6.00
Light Copper	
New York	6.37½- 6.50
*Chicago	5.50- 6.00
Cleveland	6.00- 6.25
St. Louis	5.75- 6.25
Light Brass	
*Chicago	3.50- 3.75
Cleveland	3.50- 3.75
St. Louis	3.50- 4.00
Lead	
New York	3.50- 3.75
Cleveland	3.50- 3.75
Chicago	3.37½-3.62½
St. Louis	3.50- 4.00
Zinc	
*New York	3.00-3.12½
Cleveland	2.50- 2.75
St. Louis	2.50- 3.00
Aluminum	
Borings, Cleveland	9.00- 9.50
Mixed, cast, Cleve.	13.25-13.50
Mixed, cast, St. L.	13.00-13.25
Clips, soft, Cleve.	15.00-15.50

SECONDARY METALS

Brass ingot, 85-5-5-5	9.50
Stand. No. 12 alum.	17.00

Iron and Steel Scrap Prices

Corrected to Friday night. Gross tons delivered to consumers, except where otherwise stated

HEAVY MELTING STEEL

Birmingham	10.00-10.75
Boston, dock, expt.	11.25-11.50
Boston, domestic	10.25
Buffalo, No. 1	13.50-14.00
Buffalo, No. 2	12.00-12.50
Chicago, No. 1	13.50-14.00
Cleveland, No. 1	14.50-15.00
Cleveland, No. 2	13.50-14.00
Detroit, No. 1	11.25-11.75
Detroit, No. 2	9.50-10.00
Eastern Pa., No. 1	13.00-13.50
Eastern Pa., No. 2	12.00-12.50
Federal, Ill.	11.00-11.50
Granite City, R. R.	12.50-13.00
Granite City, No. 2	10.75-11.25
N. Y., deal. No. 2	8.00- 8.50
N. Y., deal. barge (No. 1 for export)	10.00
Pitts., No. 1 (R. R.)	15.50-16.00
Pitts., No. 1 (dlr.)	14.75-15.25
Pittsburgh, No. 2	13.50-14.00
St. Louis	11.25-11.75
Toronto, dealers	7.50
Valleys, No. 1	15.25-15.75

COMPRESSED SHEETS

Buffalo, dealers	12.00-12.50
Chicago, factory	12.75-13.25
Chicago, dealer	12.25-12.75
Cleveland	14.25-14.75
Detroit	11.50-12.00
E. Pa., new mat.	13.00-13.50
Pittsburgh	15.00-15.25
St. Louis	9.00- 9.50
Valleys	15.00-15.50

BUNDLED SHEETS

Buffalo	11.00-11.50
Cincinnati, del.	8.25- 8.75
Cleveland	10.50-11.00
Pittsburgh	13.50-14.00
St. Louis	7.25- 7.75
Toronto, dealers	4.50

SHEET CLIPPINGS, LOOSE

Chicago	9.00- 9.50
Cincinnati	7.00- 7.50
Detroit	8.50- 9.00
St. Louis	6.50- 7.00

STEEL RAILS, SHORT

Birmingham	12.50-13.00
Buffalo	15.75-16.25
Chicago (3 ft.)	15.75-16.25
Chicago (2 ft.)	16.25-16.75
Cincinnati, del.	14.75-15.25
Detroit	15.00-15.50
Pitts., open-hearth, 3 ft. and less	16.25-16.75
St. Louis, 2 ft. & less	15.50-16.00

STEEL RAILS, SCRAP

Boston	9.00- 9.50
Chicago	13.50-14.00
Pittsburgh	15.25-15.75
St. Louis	14.50-15.00
Buffalo	13.50-14.00
Toronto, dealers	8.50

STOVE PLATE

Birmingham	7.00- 7.50
Boston, dealers	6.00- 6.25
Buffalo	11.25-11.75
Chicago	7.75- 8.25
Cincinnati, dealers	8.25- 8.75
Detroit, net	9.00- 9.50
Eastern Pa.	10.50-11.00
N. Y., deal. fdry.	7.50- 7.75
St. Louis	7.50- 8.00
Toronto, dealers, net	5.50

COUPLERS, SPRINGS

Buffalo	14.75-15.25
Chicago, springs	15.00-15.50
Eastern Pa.	17.00-17.50
Pittsburgh	17.25-17.75
St. Louis	13.50-14.00

ANGLE BARS—STEEL

Chicago	14.50-15.00
St. Louis	14.00-14.50
Buffalo	14.50-15.00

RAILROAD SPECIALTIES

Chicago	15.00-15.50

LOW PHOSPHORUS

Buffalo, billet and bloom crops	15.00-15.50
Cleveland, billet, bloom crops	17.50-18.00
Eastern Pa., crops	17.00-17.50
Pittsburgh, billet, bloom crops	17.25-17.75
Pittsburgh, sheet bar crops	16.75-17.25

FROGS, SWITCHES

Chicago	13.50-14.00
St. Louis, cut	13.00-13.50

SHOVELING STEEL

Chicago	13.50-14.00
Federal, Ill.	11.00-11.50
Granite City, Ill.	10.75-11.25
Toronto, dealers	6.50

RAILROAD WROUGHT

Birmingham	7.50- 8.00
Boston, dealers	7.25- 7.50
Buffalo, No. 1	12.00-12.50
Buffalo, No. 2	13.50-14.00
Chicago, No. 1, net	12.50-13.00
Chicago, No. 2	13.50-14.00
Cincinnati, No. 2	11.75-12.25
Eastern Pa.	14.00-14.50
St. Louis, No. 1	11.00-11.50
St. Louis, No. 2	12.50-13.00
Toronto, No. 1, dlr.	7.00

SPECIFICATION PIPE

Eastern Pa.	12.00-12.25
New York, dealers	7.75- 8.00

BUSHELING

Buffalo, No. 1	12.00-12.50
Chicago, No. 1	13.00-13.50
Cinci., No. 1, deal.	9.00- 9.50
Cincinnati, No. 2	4.75- 5.25
Cleveland, No. 2	8.50- 9.00
Detroit No. 1, new	10.50-11.00
Valleys, new, No. 1	14.25-14.75
Toronto, dealers	6.00

MACHINE TURNINGS

Birmingham	6.00- 7.00
Boston, dealers	3.75- 3.90
Buffalo	7.00- 7.25
Chicago	7.00- 7.50
Cincinnati, dealers	6.25- 6.75
Cleveland	8.00- 8.50
Detroit	6.25- 6.75
Eastern Pa.	8.50
New York, dealers	4.75- 5.00
Pittsburgh	10.00-10.50
St. Louis	4.50- 5.00
Toronto, dealers	4.00
Valleys	10.50-11.00

BORINGS AND TURNINGS

For Blast Furnace Use

Boston, dealers	2.50- 2.75
Buffalo	8.50- 9.00
Cincinnati, dealers	6.25- 6.75
Cleveland	8.50- 9.00
Detroit	6.75- 7.25
Eastern Pa.	6.50- 7.00
New York, dealers	3.25- 3.75
Pittsburgh	8.75- 9.25
Toronto, dealers	4.00

CAST IRON BORINGS

Birmingham, plain	5.00- 6.00
Boston, chemical	6.50- 6.75
Boston, dealers	3.50- 4.00
Buffalo	8.25- 8.50
Chicago	6.50- 7.00
Cincinnati, dealers	6.25- 6.75
Cleveland	8.50- 9.00
Detroit	6.75- 7.25
E. Pa., chemical	11.00-13.00
New York, dealers	4.50- 5.00
St. Louis	4.00- 4.50
Toronto, dealers	5.00

PIPE AND FLUES

Cincinnati, dealers	8.25- 8.75
Chicago, net	8.00- 8.50

RAILROAD GRATE BARS

Buffalo	11.00-11.50
Chicago, net	9.00- 9.50
Cincinnati	7.25- 7.75
Eastern Pa.	10.50-11.00
New York, dealers	7.00- 7.50
St. Louis	7.50- 8.00

FORGE FLASHINGS

Boston, dealers	7.75- 8.00
Buffalo	12.00-12.50
Cleveland	13.50-14.00
Detroit	9.75-10.25
Pittsburgh	13.50-14.00

FORGE SCRAP

Boston, dealers	6.00- 7.00
Chicago, heavy	16.00-16.50
Eastern Pa.	12.50-13.00

ARCH BARS, TRANSOMS

St. Louis	13.50-14.00

AXLE TURNINGS

Boston, dealers	7.00- 7.25
Buffalo	11.00-11.50
Chicago, elec. fur.	13.50-14.00
Eastern Pa.	12.00-12.50
St. Louis	9.00- 9.50
Toronto	4.50

STEEL CAR AXLES

Birmingham	12.00-13.00
Boston, ship. point.	11.00-11.25
Buffalo	15.25-15.75
Chicago, net	14.75-15.25
Eastern Pa.	17.00
St. Louis	13.50-14.00
Toronto	8.50

SHAFTING

Boston, ship point.	13.75-14.00
Eastern Pa.	19.00-19.50
New York, dealers	14.75-15.25
St. Louis	13.50-14.00

CAR WHEELS

Birmingham	11.00-12.50
Boston, iron deal.	8.75- 9.00
Buffalo, iron	13.50-14.00
Buffalo, steel	16.00-16.50
Chicago, iron	13.25-13.75
Chicago, rolled steel	15.00-15.50
Cincinnati, iron	11.75-12.25
Eastern Pa., iron	15.00-15.50
Eastern Pa., steel	17.00-17.50
Pittsburgh, iron	14.25-14.75
Pittsburgh, steel	17.00-17.50
St. Louis, iron	11.50-12.00
St. Louis, steel	13.25-13.75
Toronto, net	8.50

NO. 1 CAST SCRAP

Birmingham	11.00-12.00
Boston, No. 1 mach.	9.25- 9.75
Boston, No. 2	9.25- 9.75
Boston, tex. con.	11.50-12.00
Buffalo, cupola	12.75-13.25
Buffalo, mach.	13.50-14.00
Chicago, agri. net	10.50-11.00
Chicago, auto	12.00-12.50
Chicago, mach. net	12.50-13.00
Chicago, railr'd net	11.75-12.25
Cinci., mach. cup	11.25-11.75
Cleveland, mach.	16.00-16.50
Eastern Pa., cupola	14.00-14.50
E. Pa., mixed yard	13.00
Pittsburgh, cupola	14.50-15.00
San Francisco, del.	13.50-14.00
Seattle	10.00-11.00
St. Louis, No. 1	11.25-11.75
St. L., No. 1 mach.	13.25-13.75
Toronto, No. 1, mach., net	9.00

HEAVY CAST

Boston, del.	8.25- 8.50
Buffalo, break.	11.00-11.50
Cleveland, break	12.50-13.00
Detroit, No. 1 mach. net	13.00-13.50
Detroit, break.	11.00-11.50
Detroit, auto net	12.50-13.00
Eastern Pa.	13.50
N. Y., break. deal.	9.50- 9.75
Pittsburgh	13.50-14.00

MALLEABLE

Birmingham, R. R.	11.50-12.50
Boston, consum.	16.75-17.25
Buffalo	16.00-16.50
Chicago, R. R.	17.00-17.50
Cincinnati, agri. del.	13.50-14.00
Cleveland, rail	17.50-17.75
Detroit, auto, net	14.50-15.00
Eastern Pa., R. R.	17.50-18.00
Pittsburgh, rail	18.00-18.50
St. Louis, R. R.	15.00-15.50
Toronto, net	7.00

RAILS FOR ROLLING

5 feet and over

Birmingham	12.00-13.00
Boston, dealers	9.00- 9.50
Buffalo	13.50-14.00
Chicago	15.00-15.50
Eastern Pa.	15.00-15.50
New York, dealer	10.25-10.50
St. Louis	14.25-14.75

LOCOMOTIVE TIRES

Chicago (cut)	15.50-16.00
St. Louis, No. 1	12.00-12.50

LOW PHOS. PUNCHINGS

Buffalo	15.25-15.75
Chicago	16.25-16.75
Eastern Pa.	16.00-16.50
Pittsburgh (heavy)	17.50-18.00
Pittsburgh (light)	16.50-17.00

Iron Ore

Lake Superior Ore

Gross ton, 51½%

Lower Lake Ports

Old range bessemer	$4.80
Mesabi nonbess.	4.50
High phosphorus	4.40
Mesabi bessemer	4.65
Old range nonbess.	4.65

Eastern Local Ore

Cents, unit, del. E. Pa.

Foundry and basic 56-63% con. (nom.)	8.00- 9.00
Cop.-free low phos. 58-60% (nom.)	10.00-10.50

Foreign Ore

Cents per unit, f.a.s. Atlantic ports (nominal)

Foreign manganiferous ore, 45.55% iron, 6-10% man.	10.50
No. Afr. low phos.	10.50
Swedish basic, 65%	9.50
Swedish low phos.	10.50
Spanish No. Africa basic, 50 to 60%	10.50
Tungsten, spot sh. ton unit, duty pd.	$15.85-16.00
N. F., fdy., 55%	7.00
Chrome ore, 48% gross ton, c.i.f.	19.25

Manganese Ore

(Nominal)

Prices not including duty, cents per unit cargo lots

Caucasian, 50-52%	26.00
So. African, 50-52%	26.00
Indian, 50-52%	26.00

Warehouse Iron and Steel Prices

Cents per pound for delivery within metropolitan districts of cities specified

STEEL BARS

Baltimore*	3.00c
Boston††	3.10c
Buffalo	3.00c
Chattanooga	3.36c
Chicago (j)	3.00c
Cincinnati	3.22c
Cleveland	3.00c
Detroit	3.09c
Houston	3.00c
Los Angeles	3.60c
Milwaukee	3.11c-3.26c
New Orleans	3.35c
New York‡ (d)	3.31c
Pitts. (h)	2.95c-3.10c
Philadelphia*	3.03c
Portland	3.50c
San Francisco	3.25c
Seattle	3.70c
St. Louis	3.25c
St. Paul	3.25c-3.40c
Tulsa	3.25c

IRON BARS

Portland	3.40c
Chattanooga	3.36c
Baltimore*	3.05c
Chicago	2.75c
Cincinnati	3.22c
New York‡(d)	3.36c
Philadelphia*	2.93c
St. Louis	3.25c
Tulsa	3.25c

REINFORCING BARS

Buffalo	2.60c
Chattanooga	3.36c
Chicago	2.10c-2.60c
Cleveland (c)	2.10c
Cincinnati	3.25c
Houston	3.25c
Los Ang., cl.	2.45c
New Orleans	3.50c
Pitts., plain (h)	3.05c
Pitts., twisted squares (h)	3.175c
San Francisco	2.45c
Seattle	2.45c
St. Louis	3.25c
Tulsa	3.25c
Young.	2.30c-2.60c

SHAPES

Baltimore*	3.00c
Boston††	3.19c
Buffalo	3.25c
Chattanooga	3.56c
Chicago	3.20c
Cincinnati	3.42c
Cleveland	3.31c
Detroit	3.42c
Houston	3.00c
Los Angeles	3.60c
Milwaukee	3.31c
New Orleans	3.55c
New York‡(d)	3.37c
Philadelphia*	2.98c
Pittsburgh (h)	3.15c
Portland (i)	3.50c
San Francisco	3.25c
Seattle (i)	3.70c
St. Louis	3.45c
St. Paul	3.45c
Tulsa	3.50c

PLATES

Baltimore*	3.00c
Boston††	3.21c
Buffalo	3.37c
Chattanooga	3.56c
Chicago	3.20c
Cincinnati	3.42c
Cleveland, ¼-in. and over	3.31c
Detroit	3.42c
Detroit, 3/16-in.	3.65c
Houston	3.00c
Los Angeles	3.60c
Milwaukee	3.31c
New Orleans	3.55c
New York‡(d)	3.40c
Philadelphia*	2.98c
Phila. floor	4.95c
Pittsburgh(h)	3.15c
Portland	3.35c
San Francisco	3.25c
Seattle	3.55c
St. Louis	3.45c
St. Paul	3.45c
Tulsa	3.50c

NO. 10 BLUE

Baltimore*	3.10c
Boston††	3.30c
Buffalo	3.62c
Chattanooga	3.36c
Chicago	3.05c
Cincinnati	3.22c
Cleveland	3.11c
Det., 8-10 ga.	3.14c
Houston	3.35c
Los Angeles	3.75c
Milwaukee	3.16c
New Orleans	3.55c
New York‡(d)	3.31c
Portland	3.35c
Philadelphia*	3.08c
Pittsburgh(h)	2.95c
San Fracisco	3.35c
Seattle	3.70c
St. Louis	3.45c
St. Paul	3.30c
Tulsa	3.70c

NO. 24 BLACK

Baltimore*†	3.60c
Boston (g)	3.95c
Buffalo	3.25c
Chattanooga	4.16c
Chicago	3.85c
Cincinnati	4.02c
Cleveland	3.91c
Detroit	3.94c
Los Angeles	4.35c
Milwaukee	3.96c
New Orleans	4.50c
New York‡(d)	3.89c
Philadelphia*†	3.60c
Pitts.** (h)	3.55c
Portland	4.10c
San Francisco	4.00c
Seattle	4.40c
St. Louis	4.10c
St. Paul	3.90c
Tulsa	4.75c

NO. 24 GALV. SHEETS

Baltimore*†	4.30c
Buffalo	4.00c
Boston (g)	4.65c
Chattanooga	4.86c
Chicago (h)	4.55c
Cincinnati	4.72c
Cleveland	4.61c
Detroit	4.72c
Houston	4.40c
Los Angeles	4.40c
Milwaukee	4.66c
New Orleans	4.95c
New York‡(d)	4.30c
Philadelphia*†	4.40c
Pitts.**(h)	4.15-4.45c
Portland	4.50c
San Francisco	4.50c
Seattle	5.00c
St. Louis	4.65c
St. Paul	4.50c
Tulsa	5.10c

BANDS

Baltimore*	3.20c
Boston††	3.30c
Buffalo	3.42c
Chattanooga	3.61c
Chicago	3.30c
Cincinnati	3.47c
Cleveland	3.36c
Detroit, 3/16-in. and lighter	3.39c
Houston	3.25c
Los Angeles	4.10c
Milwaukee	3.41c
New Orleans	3.95c
New York‡(d)	3.56c
Philadelphia	3.18c
Pittsburgh (h)	3.20c
Portland	4.25c
San Francisco	4.10c
Seattle	4.25c
St. Louis	3.55c
St. Paul	3.55c
Tulsa	3.45c

HOOPS

Baltimore	2.30c
Boston††	4.30c
Buffalo	3.42c
Chicago	3.30c
Cincinnati	3.47c
Det., No. 14 and lighter	3.39c
Los Angeles	5.85c
Milwaukee	3.41c
New York‡(d)	3.56c
Philadelphia	3.43c
Pittsburgh (h)	3.70c
Portland	5.60c
San Francisco	6.15c
Seattle	5.60c
St. Louis	3.55c
St. Paul	3.55c

COLD FIN. STEEL

Baltimore (c)	3.73c
Boston	3.90c
Buffalo (h)	3.55c
Chattanooga*	4.13c
Chicago (h)	3.50c
Cincinnati	3.72c
Cleveland (h)	3.50c
Detroit	3.79c
Los Ang. (f) (d)	5.85c
Milwaukee	3.61c
New Orleans	4.30c
New York‡(d)	3.81c
Philadelphia	3.76c
Pittsburgh	3.50c
Portland (f) (d)	6.15c
San Fran.(f) (d)	5.95c
Seattle (f) (d)	6.15c
St. Louis	3.75c
St. Paul	4.02c
Tulsa	4.65c

COLD ROLLED STRIP

Boston, 0.100-in., 500 lb. lots	3.245c
Buffalo	3.39c
Chicago	3.27c
Cincinnati (b)	3.22c
Cleveland (b)	2.85c
Detroit	3.18c
New York‡(d)	3.36c
St. Louis	3.45c

TOOL STEELS

(Applying on or east of Mississippi river; west of Mississippi 1c up)

	Base
High speed	67c
High carbon, high chrome	37c
Oil hardening	22c
Special tool	20c
Extra tool	17c
Regular tool	14c

Uniform extras apply.

BOLTS AND NUTS

(100 pounds or over)

	Discount
Chicago (a)	70
Cleveland	70
Detroit	70-10
Milwaukee	70
Pittsburgh	70

(a) Under 100 pounds, 65 off.

(b) Plus straightening, cutting and quantity differentials; (c) Plus mill, size and quantity extras; (d) Quantity base; (e) New mill classif. (f) Rounds only; (g) 50 bundles or over; (h) Outside delivery, 10c less; (i) Under 3 in.; (j) shapes other than rounds, flats, fillet angles, 3.15c.

‡Domestic steel; *Plus quan. extras; **Under 25 bundles; *†50 or more bundles; † New extras apply; ††Base 40,000 lbs., extras on less.

Prices on heavier lines are subject to new quantity differentials; 399 lbs. and less, up 50 cts.; 400 to 9999 lbs., base; 10,000 to 19,999 lbs., 15 cts. under; 20,000 to 39,999 lbs., 25 cts. under; 40,000 lbs and over, 35 cts. under base.

Current Iron and Steel Prices of Europe

Dollars at Rates of Exchange, Apr. 30

Export Prices f. o. b. Ship at Port of Dispatch—(By Cable or Radio)

	British gross tons U. K. ports £ s d		Continental Channel or North Sea ports, metric tons Quoted in dollars at current value	**Quoted in gold pounds sterling £ s d
PIG IRON				
Foundry, 2.50-3.00 Silicon	$15.44	3 2 6	$14.14	1 15 0
Basic bessemer	15.44	3 2 6*	12.13	1 10 0
Hematite, Phos. .03-.05	17.54	3 11 0	.....	.....
SEMIFINISHED STEEL				
Billets	$29.02	5 17 6	$18.99	2 7 0
Wire rods, No. 5 gage	44.21	8 19 0	36.39	4 10 0
FINISHED STEEL				
Standard rails	$40.76	8 5 0	$44.17	5 10 0
Merchant bars	1.71c	7 15 0	1.13c to 1.18c	3 2 6 to 3 5 0
Structural shapes	1.66c	7 10 0	1.12c	3 1 6
Plates, †¼ in. or 5 mm.	1.78c	8 1 3	1.55c	4 5 0
Sheets, black, 24 gage or 0.5 mm.	2.15c	9 15 0	2.12c	5 16 0††
Sheets, gal., 24 gage, corr.	2.60c	11 15 0	2.29c	6 5 0
Bands and strips	1.93c	8 15 0	1.42c	4 0 0
Plain wire, base	2.15c	9 15 0	1.92c	5 5 0
Galvanized wire, base	2.54c	11 10 0	2.15c	5 17 6
Wire nails, base	2.65c	12 0 0	1.74c	4 15 0
Tin plate, box 108 lbs.	$ 4.63	0 18 9	.....	.....

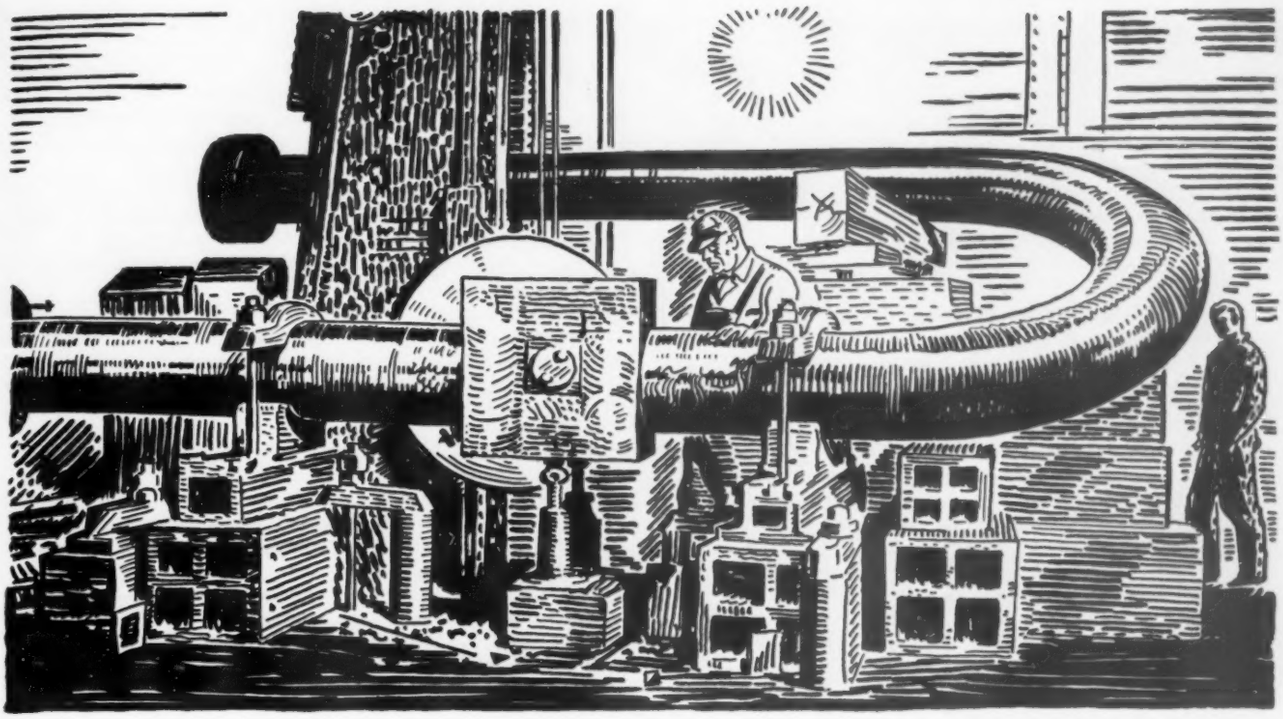
British ferromanganese $75 delivered Atlantic seaboard, duty-paid. German ferromanganese £9 0s 0d $(43.74) f.o.b.

Domestic Prices at Works or Furnace—Last Reported

	£ s d		French Francs		Belgian Francs		Reich Marks
Fdy. pig iron, Si. 2.5	$17.29	3 10 0(a)	$17.13	260	$13.78	410	$25.35	63
Basic bessemer pig iron	17.29	3 10 0(a)	12.52	190	11.77	350	27.97(b)	69.50
Furnace coke	5.19	1 1 0	6.26	95	4.12	122	7.65	19
Billets	29.02	5 17 6	28.34	430	18.66	555	38.83	96.50
Standard rails	1.82c	8 5 0	2.00c	671	1.67c	1,100	2.40c	132
Merchant bars	2.00c	9 1 0	1.67c	560	.99c	650	2.00c	110
Structural shapes	1.93c	8 15 0	1.64c	550	.99c	650	1.91c	107
Plates, †¼-in. or 5 mm.	2.00c	9 1 3	2.09c	700	1.22c	800	2.31c	127
Sheets, black	2.54c	11 10 0§	1.78c	600‡	1.33c	875‡	2.62c	144‡
Sheets, galv., corr., 24 ga. or 0.5 mm.	2.98c	13 10 0	2.84c	950	2.28c	1,500	6.75c	370
Plain wire	2.15c	9 15 0	2.68c	900	1.75c	1,150	3.15c	173
Bands and strips	2.17c	9 16 0	1.98c	650	1.22c	800	2.31c	127

*Basic. †British ship-plates. Continental, bridge plates. §24 ga. ‡1 to 3 mm. basic price, British quotations are for basic open-hearth steel. Continent usually for basic-bessemer steel. a del. Middlesbrough. b hematite. ††Close annealed.

**Gold pound sterling carries a premium of 66.00 per cent over paper sterling.



SPECIALISTS IN UNUSUAL JOBS IN STEEL

MIDVALE

History has the habit of repeating. The facts that Midvale pioneered in producing alloy steel and in laboratory control are history. With this background, it is no accident that Midvale has consistently been called upon to solve those problems which today's methods of manufacture are constantly producing. Increasingly high pressures, increasingly high temperatures, unusual and unexpected corrosive conditions—separately and in combination—these are the more obvious problems of industry.

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Bars

Bar Prices, Page 78

Pittsburgh—Hot-rolled bar ordering continues, supported by fairly steady automotive buying, increasing demand by railroad car shops and fairly good orders from agricultural implement makers. On some popular sizes, bar mills are operating with two to three weeks backlogs. The carbon grade is holding at 1.85c, Pittsburgh, base, and alloy bars at 2.45c, f.o.b. Pittsburgh.

Cleveland—Continued good demand for bars is noted from a wide variety of sources, but there is a slight tapering in tonnage.

Chicago—Activity in steel bars continues close to the active pace of the past few weeks. No slackening is noted in demand from the farm implement trade. Tractor business is expected to hold up for at least the next sixty days. Automotive demand continues to predominate. Sellers are reported holding strictly to base prices and quantity extras and deductions, although some skepticism is displayed toward the practical application of the 15-cent reduction on 150-ton orders.

New York—Steel bars are moving more freely as miscellaneous demand opens up, railroads and bolt and nut makers being among the most active buyers.

Philadelphia—Commercial steel bars continue steady, with no variation in volume over the past several weeks. Specifications are light and of miscellaneous character. Prices are steady.

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The economy of "Even Trim" Spiral Wound brushes is only one factor in their success. The refillable feature is important because it makes it possible for light gauge steel and continuous strip tin plate manufacturers to maintain uninterrupted production with low initial cost and upkeep; but of equal importance is the design of these brushes, made of wire as well as tampico and horsehair, which have been developed in close association with the designers and manufacturers of machinery for large scale production of metal plate. Our technically trained representatives will gladly place their knowledge and experience at your disposal, showing how "Even Trim" refillable Spiral Wound brushes can be of service to you. There's no obligation. Write today to:

A typical "Even Trim" tampico sheet steel scrubber. Similar brushes are made of wire or horsehair.

PITTSBURGH PLATE GLASS COMPANY BRUSH DIVISION · BALTIMORE · MD.

Plates

Plate Prices, Page 78

Philadelphia—Plate sellers are focusing attention principally on car requirements, particularly those now pending for the 700 cars that will be built in the East for the Erie and on the 5400 freight cars being figured for the Chesapeake & Ohio. Ship tonnage momentarily is light, following substantial buying earlier in the year. However, close to 5000 tons of hull steel is still pending for the tanker placed several weeks ago by the Atlantic Refining Co. with the Sun Shipbuilding Co., Chester, Pa.; and the construction award of other ship work is also pending. This includes the two freighters, requiring close to 6000 tons each, for the Matson lines, San Francisco, on which bids will be opened this month and on which the New York Shipbuilding Co., Camden, N. J., and the Sun yard are expected to submit figures. This latter yard, as noted some time ago, is also low on two passenger-cargo boats, requiring 5000 tons of hull steel each, for the American-South African Steamship Lines Inc. and award of this business is yet to be made. Building construction and tank work have proved disappointing to platemakers so far this year.

Pittsburgh—A total of 1750 tons of steel plates and structural shapes will be fabricated at the Leetsdale, Pa., yards of Bethlehem Steel Co. to complete an order by Aug. 1 for Anderson, Clayton Co., New Orleans, covering eight riveted steel barges, this contract having been closed on last week. Hatfield-Campbell Creek Coal Co., Cincinnati, closed bids May 1 on 25 all-steel barges, which will require about 3700 to 3800 tons of plates and shapes for fabrication. Plates are quoted 1.80c, f.o.b., Pittsburgh.

Chicago—Large plate tonnage is coming from the car builders and car repair shops. The comparatively large number of cars now pending makes

the outlook fairly satisfactory. A few miscellaneous tank jobs are reported but do not account for tonnage of any importance.

New York—Plate tonnage still lags, pending distribution of substantial carbuilding requirements. While the navy is figuring construction of the United States liner requiring 15,000 tons of steel, some well informed interests doubt if construction will go ahead. Indications are that the navy will submit a bid more in line with estimates but doubt is expressed if the navy is adequately equipped to build a vessel of this type.

San Francisco—Bookings during the first four months of the year have been exceptionally heavy and awards so far exceed the entire tonnage booked during all of 1935. To date 54,771 tons have been let, compared with only 52,105 tons for 1935.

Seattle—Pacific Northwest plants report a normal spring volume, mostly in small tonnages for ship repair jobs, service station construction, tanks for fishing vessels and reduction plants in which activity is marked. No large tonnages are up for figures in this area.

Contracts Placed

7475 tons, steel tunnel lining, Fort Peck, Mont., to Chicago Bridge & Iron Works, Chicago.

1750 tons, eight 195 x 35 x 11-foot riveted steel barges, for Anderson, Clayton Co., New Orleans, to Bethlehem Steel Co., Bethlehem, Pa.

1200 tons, caissons, Connecticut river bridge, Middletown, Conn., to Jones & Laughlin Steel Corp., Pittsburgh, through Merritt-Chapman & Scott Corp., New York.

500 tons, elevated tank and tower, plates and shapes, Rockville Center, L. I., to Pittsburgh-Des Moines Steel Co., Pittsburgh.

260 tons, drydock, South Chicago, Ill., to Manitowoc Shipbuilding Co., Manitowoc, Wis.

150 tons, two tanks, West Point, New York, by war department, reported awarded to Chicago Bridge & Iron Works, Chicago.

Contracts Pending

425 tons, two tank barges for Standard Oil Co. of Louisiana; bids being tabulated.

Quicksilver

New York—Quicksilver prices continue easy, on absence of active demand. Small lots of 15 to 25 flasks are $76.75 to $77.25, with nominal prices on round lots of 100 flasks from $76 to $76.50.

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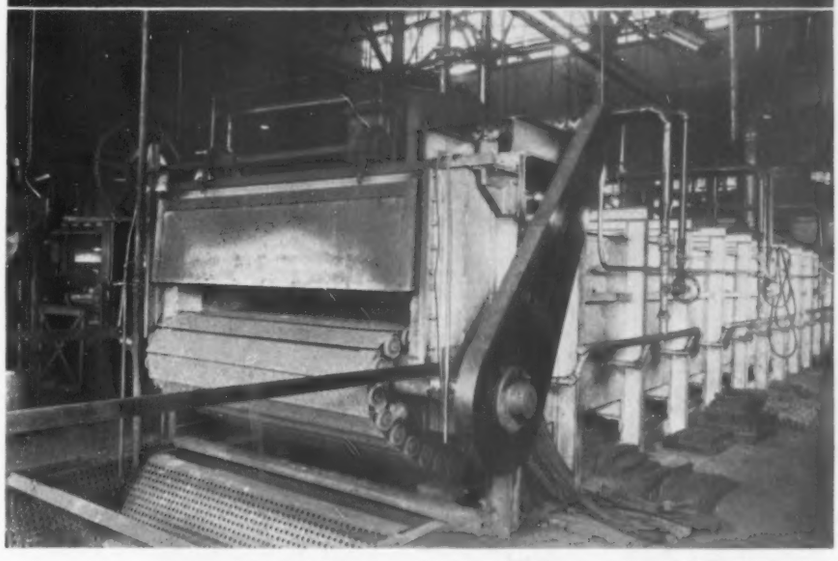

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Armstrong's

HIGH TEMPERATURE INSULATION

Transportation

Track Material Prices, Page 79

Placing of more than 8000 tons of rails and 777 freight cars presented the high lights of railroad participation in the steel market the past week. Nickel Plate divided its car order among three builders.

Carnegie-Illinois Steel Corp., Chicago, took 3660 tons of rails, Tennessee Coal, Iron & Railroad Co., Birmingham, Ala., 3700 tons and Inland Steel Co., Chicago, 1000 tons. Considerable tonnage of rails is still pending, to add further to mill backlogs.

Northern Pacific is inquiring for 750 freight cars and Missouri Pacific has not closed on its inquiry for 2000 cars. Cars for which bids were asked last week by the Chesapeake & Ohio and Pere Marquette are still pending.

A leading Pittsburgh steel producer recently booked an order for 2000 tons of splice bars.

American Car & Foundry Motors Co., New York, has booked 60 buses for a Boston transportation interest and White Motor Co., Cleveland, 40 buses for the Cleveland street railway company.

Car Orders Placed

Nickel Plate, 777 freight cars, as follows: General American Car Co., Chicago, 500 box cars, 50-ton capacity; Bethlehem Steel Car Co., Bethlehem, Pa., 200 gondolas, 50-ton capacity, 50 flat cars, 50-ton capacity, and 25 gondolas, 70-ton capacity; American Car & Foundry Co., New York, two 100-ton flats.

Rail Orders Placed

Kansas City Southern, 3000 tons to Carnegie-Illinois Steel Corp., Chicago, and 100 tons to Inland Steel Co., Chicago.

Southern, 3700 tons 100-pound rails to Tennessee Coal, Iron & Railroad Co., Birmingham, Ala.; accessories to same supplier.

St. Louis board of public service, 660 tons, 100-pound rail and accessories, for municipal bridge, to Carnegie-Illinois Steel Corp., Chicago.

Car Orders Pending

750 cars, Northern Pacific, consisting of 500 gondolas and 250 flat cars.

Buses Booked

White Motor Co., Cleveland, forty 32-passenger, 12-cylinder pancake motors for Cleveland Railway Co., Cleveland.

American Car & Foundry Motors Co., New York: Sixty buses with Hall-Scott horizontal motors, for Eastern Massachusetts Street Railway Co., Boston.

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Sheets

Sheet Prices, Page 78

Pittsburgh—April sheet specifications were slightly larger than those of March. During the past week, however, requirements were down slightly. Railroad car shops have been outstanding buyers of sheets recently for the construction of car roofs. Sheet mills still have fairly good backlogs and last week were operating at 70 to 75 per cent. The quantity differential system of quoting sheets continues to meet with a generally satisfactory reception among consumers. Base prices are unchanged.

Cleveland—Sheet mills in northern Ohio are well booked through May and some into early June with an operating rate around 85 per cent. New business continues in fair volume but not at the preceding weeks' rate. Some study is being given to the black and galvanized specification on 150-ton lots, with special reference to the phrase "at one time." Inspection and shipment of

such lots even all of a size sometimes compel extension of time for completion by most mills of around a week or even fortnight under present rolling conditions.

Chicago—Sheet mills continue to hold up near peak levels, largely as a reflection of heavy automotive demand. Higher prices are being maintained although the large amount of additional flat-rolled steel capacity now under construction is causing some speculation in the trade regarding quotational levels some time hence. Automotive business apparently will hold up well through May, and June also probably will be a fairly good month. Consumption by refrigerator, stove, farm machinery and miscellaneous industries has increased moderately.

New York—New sheet orders in the week were the largest since the end of March, with consumption heavy. Sellers look for a good month in May, notwithstanding the fact a number of consumers' requirements for the month are fairly well covered by orders placed in March.

Philadelphia—While most sheet mills have completed deliveries on March orders they still are well sold ahead on cold finished sheets, promising little under four weeks shipment. On black and blue annealed sheets they are quoting two to three weeks delivery for the most part, and on galvanized sheets around four weeks. The volume of new orders over the past week has been expanding moderately. Two leading radio manufacturers in this district are fabricating more steel than at any time so far this year, working for the most part on automobile radio sets. The state of Virginia will open bids May 8 on 240 tons of license tags. Peden Iron & Steel Co., Charlotte, N. C., has been awarded tonnage for that state.

Buffalo—District sheet mills have again speeded up output, to 85 per cent. Heavy bookings for May are reported.

Cincinnati—Fresh orders for sheets showed some recession last week. However, shipments were unaffected and rolling schedules near 90 per cent. Mill interests foresee continued high level of demand throughout May.

Birmingham, Ala.—Sheet production is steady, with good demand from various directions. Prospects are considered bright for some weeks.

Worthington Pump & Machinery Corp., Harrison, N. J., has practically completed a $175,000 addition to its Buffalo plant, and expects to hire 100 additional men when the works is in full operation. This will increase its personnel to more than 1400, the peak since 1930.

Bolts, Nuts, Rivets

Bolt, Nut, Rivet Prices, Page 79

An additional 10 per cent discount in the price of stove bolts in package lots was announced by manufacturers. Stove bolts in packages with nuts attached now are 72½-10-10 off list, and in packages with nuts separate are 72½-10-10-5 off. The case-lot requirement for application of discounts on all grades of bolts and nuts has been removed. Formerly there was an extra of 10 per cent for less full containers.

At Cleveland, manufacturers report April volume was the best so far this year. No let-down is noted in specifications from automobile manufacturers. Railroads have been buying liberally for repair purposes.

April recorded a further gain in specifications for bolts, nuts and rivets at Pittsburgh. The carriage and machine bolt market for small sizes is quoted 70-10-5 off, with larger

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CONSHOHOCKEN, PA.
BRANCHES:
Philadelphia, New York, Boston, Los Angeles, San Francisco, Seattle, Houston

110 YEARS' IRON- AND STEEL-MAKING EXPERIENCE

sizes, 70-10 off. Structural rivets are quoted 2.90c and wrought washers $6.25 off list.

Pipe

Pipe Prices, Page 79

Pittsburgh—Old Dutch Refining Co., Muskegon, Mich., is planning to build a 360-mile line from Muskegon to a point about 100 miles below Cincinnati on the Ohio river. No evidence of decline is current in the market for oil country goods, although standard pipe is still a slow moving item. Some retrenchment has occurred in specifications the past week covering mechanical tubing, but orders for boiler tubes and other tubular specialty items are steady.

Chicago—Most of the cast pipe jobs coming out at present are requiring only a carlot or two. No tonnage business has been booked recently or is in sight. The business that is coming out is mostly PWA financed. These orders, while small individually, are resulting in a fair total tonnage for producers, which is expected to hold up over the next 60 days or so. Prices are steady.

Continental Oil Co., Ponco City, Okla., is planning to build a 79-mile pipe line in western Kansas. Contract has been let to Williams Bros. Construction Co. The line is to be assembled by the Lindewelding method. Kentucky Natural Gas Corp., Kansas City, Mo., plans to install a 24-mile Lindewelded line between Terre Haute and Montezuma, Ind. Contract for this line has been awarded to Connor & Sons Construction Co., Kansas City.

San Francisco—Demand is quiet, with only two inquiries current. The largest involves over 4100 tons of 16-inch pipe for Sheridan, Wyo., bids on which have been opened.

Seattle—Business is slow. Several sizable jobs are being delayed, awaiting allotment of funds or approval of contracts. Few projects are pending. Seattle has opened bids for 35 tons of 8-inch cast pipe, and on May 5 will receive tenders for 150 tons 8-inch cast pipe and 8000 feet 20-inch steel pipe for East Marginal Way. Canby, Oreg., opened bids April 25 for 1000 feet of 4-inch steel mains and couplings.

Cast Pipe Pending

150 tons, 8-inch East Marginal Way, Seattle; bids May 5.

Steel Pipe Pending

Unstated, 8000 feet, 20-inch, East Marginal Way, Seattle; bids May 5.

Strip Steel

Strip Prices, Page 79

Pittsburgh—Specifications for strip steel leveled off last week, following a slight decline the week preceding, so that the April market in aggregate showed practically no change from March. At present the hot-rolled strip steel industry is producing at 60 per cent of capacity, and cold strip at 68 per cent. On a Pittsburgh base, hot-rolled strip is being tested at 1.85c, base, for single shipments of 1 to 25-ton size, and 2.60c, base, Pittsburgh or Cleveland, is the market on 3 to 25-ton single shipments.

Cleveland—Strip producers are busy on increased volume of specifications, but new business on wider widths is not keeping pace with narrow widths. Refrigerator makers and a wider variety of consumers of narrow strip are anxious for shipments.

Chicago—Both hot and cold-rolled strip business continues in substantial volume. Little or no tapering in automotive specifications is anticipated before the end of May, and June also is expected to make an ex-

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cellent showing. General manufacturing industries are accounting for a considerable portion of current active consumption. Sellers report prices well maintained on business now being booked. According to reports here, a Milwaukee company has booked the frame contract for Packard's new six.

New York—Buying of cold-rolled strip is being stimulated by further releases from automobile accessory manufacturers, with actual consumption the heaviest of any time this year.

Philadelphia—Narrow strip tonnage still lags. Most purchasers have stocks from orders placed at concessions in the closing weeks of last quarter. Further, the slitting of sheets by some leading consumers is contributing to reduced volume of business at this time. Prices appear steady.

Wire

Wire Prices, Page 79

Pittsburgh—The merchant wire market evidences a complete cleanup on shipments against expired first quarter blanket contracts, with the result that some slight test has been given to the new prices based on nails at $2.10 per keg, Pittsburgh. Some slight curtailment is now taking place in shipments of plain manufacturing and spring wire, and in general the market is not as active as a month ago. Plain manufacturing wire, 6-9 gage base, is quoted 2.40c, base, Pittsburgh or Cleveland, and spring wire, 3.05c, on the same basis.

Cleveland—Demand for manufacturers' wire is holding up exceptionally well, tonnage having shown little variation in several weeks. Bolt and nut interests having been specifying regularly, with production at the highest point this year. Adverse weather has retarded sales of fence to agricultural districts. Prices are steady.

Chicago — Consumers apparently are working off excess stocks purchased over the past several weeks when a buying wave brought in the most business in any similar period in at least six years. Consumption continues at an active pace and sellers feel certain buying again will tend upward shortly.

Semifinished

Semifinished Prices, Page 79

Pittsburgh—Reversing the trend of two weeks ago, more forward buying of semifinished steel was in evidence last week. Increases were confined chiefly to sheet bars and rerolling billets, a factor making for this increase being the high rate of activity in tin plate mills. Buying of wire rods shows some slight decline, but the continuing good demand for oil country pipe has had its reflection in steady shipments of tube rounds. Semifinished steel prices are firm.

Cold Finished

Cold Finished Prices, Page 79

Pittsburgh—The cold-drawn carbon steel bar market still reflects a healthy tone in spite of a slight decline in specifications late in April. Most producers have backlogs upon which to run through this month, which should in turn be increased by sustained automotive buying. Some automotive parts makers are now circulating blueprints covering proposed parts for 1937 models to be made of cold-drawn steel. Since these prints cover special cold-drawn shapes, they will require several months of preparation in the form of new rolls, dies, etc. Carbon cold-drawn bars at the 2.10c, base, Pittsburgh, market are firm and without change.

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Shapes

Structural Shape Prices, Page 78

New York—Awards are light, but numerous jobs pending for some time are moving rapidly to the contracting stage. In addition a number of new projects of size have been added to the pending list. Prices on plain structural shapes continue unchanged at 1.90c, base, Bethlehem, Pa.

Although bookings of structural steel in March declined from the first two months of the year, the monthly average for the first quarter held up to 51.5 per cent of normal, according to the American Institute of Steel Construction. Normal is considered as the annual average of shipped tonnages as published by United States department of commerce for the years 1928-31, inclusive. March shipments showed an increase over the previous two months, amounting to 43.8 per cent of normal.

Pittsburgh—Plan of the Union Carbide Co., New York, to spend approximately $20,000,000 in plant construction and improvement to existing divisions is looked upon as the source of considerable volume of inquiry in the near future, although no actual inquiries have appeared for this building program. Meanwhile, the largest structural steel contract pending here has not been placed, 2800 tons, required for the Westinghouse Electric & Mfg. Co. building at Mansfield, O., and on which Rust Engineering Co. is general contractor. State highway department is now advertising for bids on 650 tons of fabricated structural steel in a Westmoreland county steel truss bridge May 15. Plain structural shapes remain quoted at an unchanged Pittsburgh base of 1.80c, but a weak market is evidenced in fabricated and erected quotations.

Chicago—Actual releases were the heaviest reported during 1936 to date. New sales likewise were heavy. Most of the business is coming from government sources but some industrial jobs also are appearing. Bids go in May 5 on 15,000 tons for approaches to the outer drive bridge over the Chicago river. A number of grade elimination jobs are expected to come up in the near future. These all have been authorized, but many have not been designed as yet.

Philadelphia—An increasing volume of business is pending but new orders continue disappointingly light to fabricators. Few orders involving 100 tons and over have been reported. John McShain has been awarded general contract for the bureau of printing and engraving building in Washington, involving 1400 tons of shapes, and 5000 tons of rerolled bars. No action has yet been taken on award of the vocational school at Ninth and Mifflin streets, on which McCloskey & Co. were low. Bid exceeded appropriation and there is still question as to what will be done. This structure will take 5000 tons of shapes in addition to 1700 tons of bars. Another school at Lehigh and Twenty-second street, requiring similar tonnages, is expected to be brought out for figures soon.

Birmingham, Ala.—With the larger fabricating shops now working on

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Shape Awards Compared

	Tons
Week ended May 1	14,884
Week ended April 24	13,326
Week ended April 17	18,991
This week, 1935	15,296
Weekly average, 1935	17,081
Weekly average, 1936	19,719
Weekly average, April	16,431
Total to date, 1935	279,044
Total to date, 1936	354,945

some of the heavier tonnage contracts, on hand for several weeks, inroads will be made on backlogs during the next four to six weeks.

San Francisco — The structural shape market continues fairly active. Awards in the week aggregated 18,908 tons, bringing the total for the year to 60,995 tons, compared with 29,595 tons in the corresponding period of 1935. Consolidated Steel Corp., Los Angeles, booked 1200 tons for an addition to the plant of the Consolidated Aircraft Corp., San Diego. The Century-Fox Film Corp., Los Angeles, is expected to call for bids soon for two sound stages requiring 600 tons.

Seattle—Fabricating plants are well supplied with jobs but new projects are slow in developing. Pending tonnages are small. Washington state rejected bids for a bridge project at Pasco involving 230 tons shapes, 63 tons reinforcing and 100 tons of edge piling. Hoffman Construction Co., Portland, Oreg., is low bidder at $410,212 for the state overcrossing at Union avenue, Portland, requiring about 750 tons.

Shape Contracts Placed

1600 tons, Kings county hospital, nurses home, Brooklyn, N. Y., to Ingalls Iron Works Co., Birmingham, Ala., through Riess & Weinsier, New York.

1240 tons, West Bedford Park boulevard, viaduct, Bronx, N. Y., to Shoemaker Bridge Co., Pottstown, Pa.

1200 tons, addition to Consolidated Aircraft Co., San Diego, Calif., to Consolidated Steel Corp., Los Angeles.

1000 tons, plant addition, Dayton Power & Light Co., Dayton, O., to Fort Pitt Bridge Works, Pittsburgh.

895 tons, state highway bridge, Lawrence county, Pennsylvania, to Fort Pitt Bridge Works, Pittsburgh.

820 tons, New York state transit bridge, Bronx, N. Y., to Bethlehem Steel Co., Bethlehem, Pa.

610 tons, H. J. Heinz Co. factory building, Leamington, Ont., to Hamilton Bridge Co., Hamilton, Ont.

525 tons, bridge, Pope county, Iowa, to Des Moines Steel Co., Des Moines, Iowa.

490 tons, high school, Nashua, N. H., to Groisser & Shlager Iron Works, Somerville, Mass.

450 tons, bridge, Wyoming, to Midwest Steel & Iron Works Co., Denver.

400 tons, Gertz department store warehouse, Jamaica, N. Y., to Harris Structural Steel Co., New York.

380 tons, steel piling for Consumers' Power Co., Zilwaukee, Mich., to Carnegie-Illinois Steel Corp., Pittsburgh.

365 tons, La Salle academy building, 44 East Second street, New York, to Dreier Iron Works, New York.

360 tons, state highway bridge, Elkland, Pa., to Fort Pitt Bridge Works, Pittsburgh.

360 tons, state highway bridge, St. Paul, to Bethlehem Steel Co., Bethlehem, Pa.

350 tons, drydock, South Chicago, Ill., to the Manitowoc Shipbuilding Co., Manitowoc, Wis.

300 tons, bridge, Clarinda, Iowa, to Paxton & Vierling Iron Works, Omaha, Nebr.

300 tons, school building, Mt. Vernon, N. Y., to Belmont Iron Works, Eddystone, Pa.

270 tons, bridges, Burnett and Oneida counties, Wisconsin, to Vierling Steel works, Chicago.

270 tons, apartment house, 187th street and Chittendon avenue, Bronx, N. Y., to Dreier Iron Works, New York.

250 tons, hospital, Wyacena, Wis., to Wausau Iron Works, Wausau, Wis.

243 tons, tunnel supports, specification 657, Gila project, Ariz., to unnamed interest.

220 tons, state highway bridge, Kingston, N. Y., to American Bridge Co., Pittsburgh.

220 tons, parcel post building, Worcester, Mass., to West End Iron Works, Cambridge, Mass.

205 tons, school building, Wilmerding, Pa., to Ingalls Iron Works Co., Birmingham, Ala.

200 tons, International Harvester Co. branch, Chicago, to Gage Structural Steel Co., Chicago.

185 tons, bridge for Denver & Rio Grande Western railroad near Denver to Wisconsin Bridge & Iron Co., Milwaukee.

180 tons, bridge, Caldwell Parish, Louisiana, to Pittsburgh-Des Moines Steel Co., Pittsburgh.

176 tons, bridge, Bureau county, Illinois, to Illinois Steel Bridge Co., Jacksonville, Ill.

175 tons, grade separation, Winnebago

PAGE
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county, Wisconsin, to Milwaukee Bridge Co., Milwaukee.

170 tons, state highway bridge, Lancaster, N. Y., to American Bridge Co., Pittsburgh.

150 tons, building, Clearing, Ill., to Joseph T. Ryerson & Son Inc., Chicago.

130 tons, state highway bridge, Fairmont, Vt., to American Bridge Co., Pittsburgh.

130 tons, manufacturing plant, Coshocton, O., to Ingalls Iron Works Co., Verona, Pa.

120 tons, state highway bridge, Ewen, Mich., to Service Supply Co., Detroit.

110 tons, theatre, Frankford avenue, Philadelphia, to Max Corchin Inc., Philadelphia.

100 tons, two steel hulls for Coulee dam project, Washington, to unstated St. Louis plant, through reclamation bureau.

100 tons, siphon covers for Los Angeles, to Bethlehem Steel Co., Bethlehem, Pa.

100 tons, nurses home, Bangor, Me., to Meguier & Jones Co., Portland, Me., through W. F. McPherson, Bangor.

Shape Contracts Pending

12,000 tons, toll lift bridge and approaches, Far Rockaway, N. Y.; bids about May 25.

2800 tons, warehouse and office building, Westinghouse Electric & Mfg. Co., Mansfield, O.

SPECIAL FLANGED SHELL

DEEP DRAWN from Monel Metal

This is but one of countless special shells, shapes, tanks, etc., produced by Hackney to meet particular requirements.

Designed for use in connection with an ice-cream freezer unit, this seamless shell is deep drawn from Monel Metal.

Resistance to stains and corrosion and a particularly fine appearance are obtained. Drawn seamless, there are no hard-to-clean places.

The Hackney deep-drawn method of forming assures high strength and uniform thickness in the finished container. The surface is smooth. The metal is free from laminations.

Send details of your requirements to Hackney. Let our engineers study them for possible recommendations for improved efficiency.

PRESSED STEEL TANK COMPANY

208 S. La Salle St. Bldg., Room 1211, Chicago
6661 Greenfield Ave., Milwaukee, Wis.
1387 Vanderbilt Concourse Bldg., New York
688 Roosevelt Bldg., Los Angeles, Calif.

Hackney
MILWAUKEE

DEEP DRAWN SHELLS AND SHAPES

2100 tons, Kings county, nurses' home and training school, Brooklyn, N. Y.; noted in STEEL, April 27, as an inquiry for 1600 tons.

1900 tons, four state highway bridges, various locations, Illinois.

1400 tons, Home Owners Loan Corp. office building, Washington.

1110 tons, state highway projects, Missouri; bids May 7 to highway commission, Jefferson City, Mo.

1000 tons, viaduct, Madison, Ill.; Illinois Steel Bridge Co., Jacksonville, Ill., low.

1000 tons, Creedmore hospital, Queens, N. Y.

1000 tons, office building, Durham, N. C.

800 tons, bridge, Fargo, N. Dak.

750 tons, state overcrossing, Union avenue, Portland, Oreg.; Hoffman Construction Co., Portland, low.

675 tons, bridge, Alters, Okla.

600 tons, grade separations, Michigan.

600 tons, two sound stages, Century-Fox Film Corp., Los Angeles; bids soon.

550 tons, highway bridges, Texas.

500 tons, bridge, Oceanside, Calif.

400 tons, telephone exchange, Lakewood, O.

338 tons, Ohio state highway bridge at Triskett road, Cleveland; bids close May 5.

350 tons, highway bridge, Rockville, Md.

350 tons, postoffice, Saginaw, Mich.; Henry Dattner, Detroit, general contractor.

325 tons, three bridges, scattered locations, Wisconsin; bids May 8.

324 tons, gate shafts and buildings, Fort Peck dam, Mont.; bids May 21.

260 tons, garage for Sanitary Grocery Co., Washington.

250 tons, store building, Pontiac, Mich., for S. S. Kresge Co.

230 tons, bridge in Franklin and Benton counties, Washington; bids rejected.

224 tons, plate girder underpass bridge, Monroe county, Pennsylvania; H. J. Williams Inc., York, Pa., low at $246,867.42 on April 24 bid.

200 tons, steel piling for Coast Guard Construction, Youngstown, N. Y.

200 tons, St. Luke's school, 139th street, Bronx, N. Y.

200 tons, garage for Penn Mutual Life Insurance Co., Philadelphia.

155 tons, steel piling for Ann Arbor railroad, Menominee, Mich.

100 tons, state highway bridge, Amherst, Mass.

100 tons, beams, American Sales Book Co. plant addition, Buffalo.

Unstated tonnage, postoffice, Canonsburg, Pa.; Structural Engineering Corp., New York, general contractor.

Unstated tonnage, postoffice, Willard, O.; Gibbons-Grable Co., Canton, O., general contractor.

Coke By-Products

Coke By-Product Prices, Page 79

New York—The market on sulphate of ammonia and naphthalene continues firm at the recent price advances. Other prices are unchanged but the market is firm. Demand for coal tar derivities in general continues sufficient to absorb the entire production.

Reinforcing

Reinforcing Bar Prices, Page 79

New York — Awards have reflected considerably more activity, although new products are coming out slowly. Mills are showing greater insistence on the maintenance of prices on the part of their dealers, causing the market to show a firmer tendency. The usual price with a few exceptions is 2.50c, base, delivered at the building site, for new billet bars. This is based on 2.05c base, Pittsburgh, plus $2 a ton covering the trucking charge in New York.

Pittsburgh—Reinforcing steel bar buying from jobbers is continuing at a high rate of activity. The market is quoted on the basis of 1.95c to 2.05c, base, Pittsburgh, for new billet quality bars in cut lengths, carload lots.

Chicago — Only 300 tons will be required in the approaches to the outer drive bridge over the Chicago river on which bids will be taken May 5. No jobs of any importance individually are appearing at present but the accumulation of small tonnages has given fabricators a fairly heavy backlog. Most of the jobs involve road projects and bridges, although some private work is coming out. Occasional price concessions are reported but in general the market is fairly steady.

Philadelphia — Sellers now have more work under active contemplation than in a number of weeks. Orders to date have come through slowly and the past week was devoid of outstanding awards. The bureau of engraving addition in Washington, on which John McShain has been awarded general contract, will take 5000 tons of rail steel bars.

San Francisco—A number of reinforcing bar awards were placed, totaling over 3800 tons. So far this year 85,518 tons have been booked, compared with 50,457 tons in the same period a year ago. Truscon Steel Co. secured 410 tons for a storage building for Century-Fox Film Corp., Los Angeles. This corporation will take bids soon for 1000 tons for two sound stages.

Seattle — Increasing demand is noted in small tonnages for industrial purposes. Awards include 1000 tons for the Coulee, Wash., dam project, let by the reclamation bureau, 750 tons to Carnegie-Illinois Steel Corp., Chicago, and 250 tons to Northwest Steel Rolling Mills, Seattle. Bids were opened April 30 at Kansas City, Mo., for 2997 tons involved in tunnel outlets and main control shaft, Fort Peck, Mont., dam project.

Reinforcing Steel Awards

1300 tons, high school, Scranton, Pa., to Bethlehem Steel Co., Bethlehem, Pa.; bids rejected on this project earlier in the year.

750 tons, Coulee dam project, Washington, to Carnegie-Illinois Steel Corp., Chicago.

550 tons, Connecticut river bridge substructure, Middletown, Conn., to Jones & Laughlin Steel Service Corp., Long Island City, N. Y., through Merritt, Chapman, & Scott Corp., New York.

400 tons, armory, Amsterdam, N. Y.,

Concrete Awards Compared

	Tons
Week ended May 1	4,679
Week ended April 24	4,627
Week ended April 17	4,875
This week, 1935	1,017
Weekly average, 1935	6,862
Weekly average, 1936	7,156
Weekly average, April	4,756
Total to date, 1935	94,088
Total to date, 1936	128,809

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Safe Non-Slip Surface
Of the Original Diamond Pattern
NEVERSLIP
ROLLED STEEL FLOOR PLATE
No Floor Plate can be said to offer adequate protection unless it affords a safe, non-slip surface from every direction . . . plus an even trucking surface.
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Too, the arrangement of the Diamonds permits unobstructed drainage and easy cleaning.
Used throughout Industry for 35 years.
Write for details and sample.
American Pressed Steel Co.
Commercial Trust Bldg.
Philadelphia, Pa.

to Bethlehem Steel Co., Bethlehem, Pa., through W. F. Hendrich Co., Cleveland.

250 tons, school buildings, Fullerton, Calif., to unnamed interest.

225 tons, grade crossing elimination, Berkeley Heights, N. J., to Igoe Bros. Inc., Newark, N. J., through H. L. Harrison & Son, Newark.

210 tons, additional to 200 tons reported, storage building, Century-Fox Film Corp., Los Angeles, to Truscon Steel Co., Los Angeles.

200 tons, sewer, contract No. 4, Queens, N. Y., to Igoe Bros., Newark, N. J., through Tomasetti Contracting Co., Brooklyn, N. Y.

200 tons, Colt's Patent Fire Arms Mfg. Co. addition, Hartford, Conn., to Concrete Steel Co., New York.

150 tons, addition to North Hollywood high school, Los Angeles, to unnamed interest.

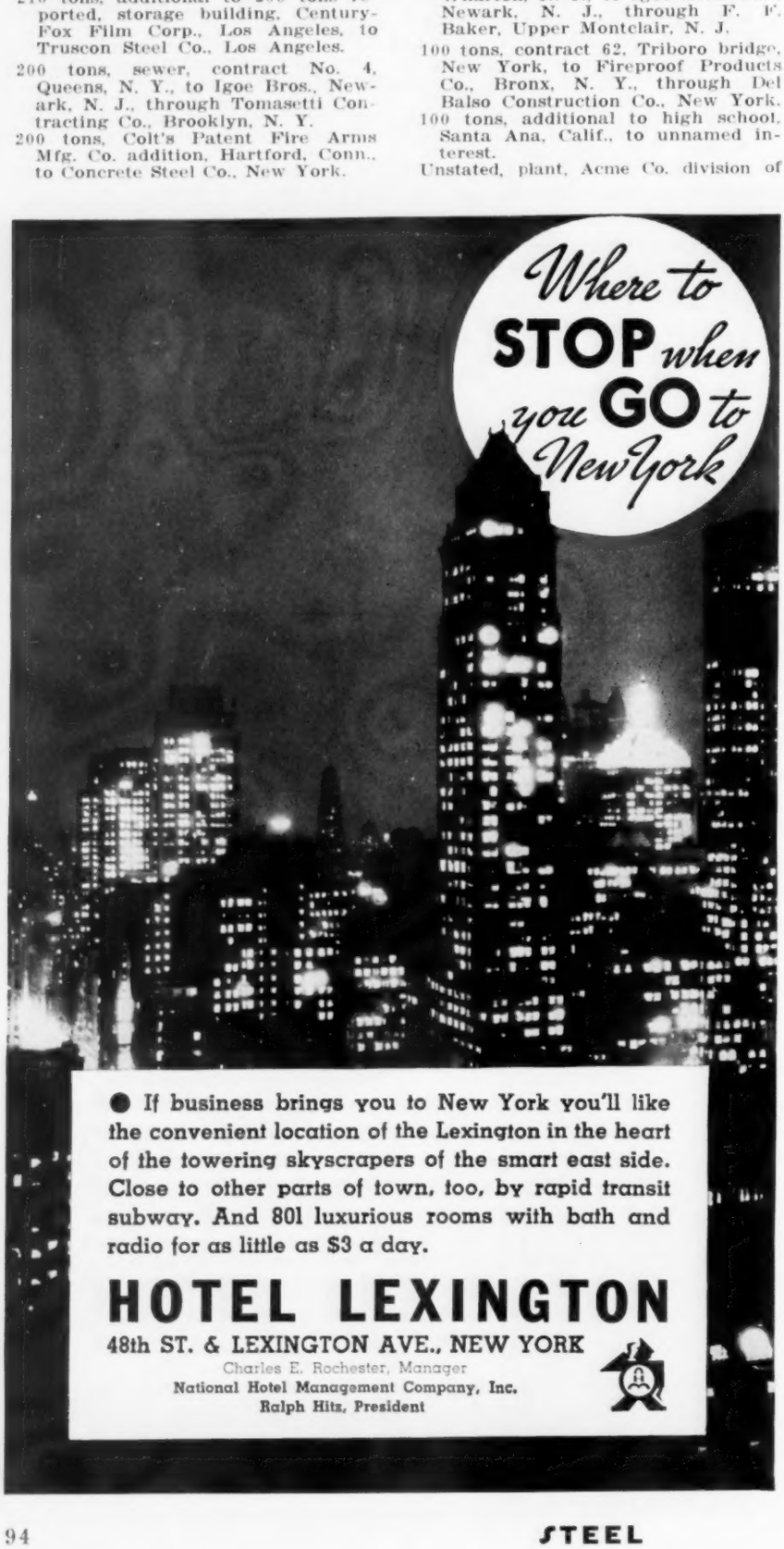
143 tons, grade crossing elimination, Lincoln Park, N. J., to Joseph T. Ryerson & Son Inc., Chicago, through Franklin Contracting Co., Newark, N. J.

101 tons, grade crossing elimination, Wharton, N. J., to Igoe Bros. Inc., Newark, N. J., through F. F. Baker, Upper Montclair, N. J.

100 tons, contract 62, Triboro bridge, New York, to Fireproof Products Co., Bronx, N. Y., through Del Balso Construction Co., New York.

100 tons, additional to high school, Santa Ana, Calif., to unnamed interest.

Unstated, plant, Acme Co. division of Crown Cork & Seal Co., Philadelphia, to Truscon Steel Co., Youngstown, O.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STOP when
you GO to
New York
● If business brings you to New York you'll like the convenient location of the Lexington in the heart of the towering skyscrapers of the smart east side. Close to other parts of town, too, by rapid transit subway. And 801 luxurious rooms with bath and radio for as little as $3 a day.
HOTEL LEXINGTON
48th ST. & LEXINGTON AVE., NEW YORK
Charles E. Rochester, Manager
National Hotel Management Company, Inc.
Ralph Hitz, President

Reinforcing Steel Pending

1000 tons, two sound stages, Century-Fox Film Corp., Los Angeles; bids soon.

750 tons, boardwalk and comfort station, Long Beach, N. Y.; Faircroft Engineering Co., Brooklyn, N. Y., low.

700 tons, superstructure, Bronx housing project, Bronx, N. Y.; bids to be opened May 15.

540 tons, gates and shaft buildings, Fort Peck dam, Mont.; bids May 21.

310 tons, shop building, Marina high school, San Francisco; O. Monson, San Francisco, low on general contract.

132 tons, Harrison street viaduct, San Francisco; bids May 6.

132 tons, over-crossing, Black River Junction, King county, Washington; General Construction Co., Seattle, general contractor.

120 tons, Ohio state highway bridge at Triskett road, Cleveland; bids close May 5.

100 tons, school auditorium, Placentia, Calif.; bids soon.

100 tons or more, state railroad undercrossing, Spokane; Triangle Construction Co., Spokane, general contractor.

100 tons, route S6, section 1, Passaic county New Jersey; bids to be opened May 18.

Pig Iron

Pig Iron Prices, Page 80

Pittsburgh—No unusually large stocks of either foundry or basic irons are being accumulated by consumers, as specifying continues on an as-needed basis. Slightly better operations are reported among steel foundries than the jobbing group, the former's improvement being due to receipt of recent railroad casting orders. The market is based on a price of $19.50 for No. 2 foundry and malleable grades, $20 for bessemer, and $19 on basic.

Cleveland — Merchant pig iron shipments in April were about 10 per cent less than those in March, which were stimulated by an impending price advance. New sales also were under the March volume. Consumption in April, however, is believed to have been heavier than in the preceding month, as evidenced by the increased use of foundry coke. Producers expect shipments in May will exceed those of April. New buying is tending to subside.

Chicago—April shipments held close to the March volume, and were well ahead of a year ago. New business now being booked indicates that the May and June volume will show little or no recession. Consumers are taking shipments out actively against second quarter contracts. Several important consumers, in fact, already have specified more than half their

second quarter tonnage. Automotive foundry operations are beginning to taper slightly, but are not expected to drop sharply for another three weeks. Farm equipment makers are going well, and more business is coming out from the railroads. One merchant furnace is expected to go in July 1.

New York—Pig iron sales were featured last week by an order for 1500 tons of basic. Orders otherwise were small, with little increase in volume, notwithstanding the fact that the melt is expanding gradually. Stocks are steadily being absorbed, and the outlook for May business is more promising. The Troy, N. Y., furnace went in blast May 1, after a few months shutdown.

Philadelphia—Foundry melt continues to hold up well, and sellers are hopeful that business will show more of a material improvement as existing stocks become worked off. Meanwhile, business is light, and sellers are disappointed over the volume.

Buffalo—Shipments late in April picked up after a slow start, but the month ran well below March in deliveries. Several barges will load this week for eastern seaboard and the May movement will be heavy if sufficient boats can be lined up to move all the iron that is offered. With this port still icebound, several furnaces are known to have less than 30 days' supply of ore on hand.

Cincinnati—Shipments of pig iron, both northern and southern, are close to recent levels on orders for small tonnages. Foundry melt is at the peak for this year, but not reflected in orders because of large supplies shipped last quarter. Current buying is for early needs. New prices are well established.

St. Louis—Movement of iron during April was about on a parity with March. New buying continues active, both for immediate requirements and future delivery. A number of interests report more of a disposition on the part of melters to invest in pig iron than has been the case in a number of years.

Birmingham, Ala.—Need for steady output at blast furnaces, 12 stacks producing, is seen and no change in market conditions is noted. There is not much iron going to surplus stock, and melters are ordering in small lots, for early delivery.

Toronto, Ont.—Demand for merchant iron is holding at the peak of the year. Sales exceed 1200 tons per week. Inquiries are more numerous. Current demand chiefly is for foundry iron, but sales of malleable are expanding. Prices are unchanged.

Pittsburgh Bridge & Iron Works has moved its sales and executive offices from the plant at Rochester, Pa., to 1910 Union Bank building, Pittsburgh.

Scrap

Scrap Prices, Page 81

Pittsburgh—The leading scrap consumer here last week was able to negotiate a purchase of more than 5000 tons of No. 1 heavy melting steel from a local yard dealer at $15, delivered to its Pittsburgh district works, and thereby forced the No. 1 steel market down 75 cents a ton from its previous quotable range. Complete lack of interest on the part of other mill consumers is evident and, well stocked for the present, they are content to wait out a market which has as yet developed few signs of steadiness. A serious test is being given the market this week when the Baltimore & Ohio closes on its list May 4, New York Central, May 6, and others within the next few days. If the market can absorb these offerings, plus that of the Pennsylvania late last week, and not decline

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CHROME and CHROME-NICKEL *ANALYSES*

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Permit a SUPERIOR representative the opportunity to broaden your product's sales appeal through standardization on these special alloyed steels.

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WORKS AT
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1017 Fisher Bldg.
Detroit, Mich.
2002 Girard Trust Bldg.
Philadelphia, Penna.

Steel Sales Corp.
129 South Jefferson St.
Chicago, Ill.

H. L. Brown.
2001 Carew Tower
Cincinnati, Ohio

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er, there is some reason to ex-
that prices may turn upward.

Cleveland—Softness in scrap prices ve brought declines in quotations a number of grades. Heavy melting steel and compressed sheets are down 50 cents and some other grades have lost 25 cents. Cast scrap has not yet felt the decline. In the Valleys a similar condition exists. Shipments are fair but no new business is being placed.

Chicago—Most scrap grades are down 50 cents a ton, due largely to heavy influx of material from outside points. Scrap has been coming from as far distant as Texas, as the result of recent attractive prices here. Mills appear to be comfortably covered for about the next 30 days and in some instances shipments are being regulated. No general and sharp decline is anticipated by scrap trade interests. It is pointed out that most mills here wish to continue the practice of unloading scrap directly from cars to charging boxes and not dip into reserve stocks. Blast furnace scrap is being laid down on local docks for water shipment to lower lake ports.

New York—Prices on iron and steel scrap are easier and declines of 50 cents a ton in dealers' buying prices are noted in connection with No. 1 and No. 2 heavy melting steel and specification pipe. The market on machine shop turnings is off about 25 cents. Corresponding declines have been registered in the dock prices of steel scrap for export. The only upward movement of the past week is one of 25 cents a ton on No. 2 cast for export.

Philadelphia—Scrap continues to come out freely and prices reflect the easier tendency noted over the past fortnight. No. 1 steel is now quotable at $13 to $13.50, delivered, consuming point, with the Bethlehem, Pa., consumer able to draw from outside areas at as low as $13 and a Harrisburg, Pa., consumer having recently closed on a tonnage at $13.50. No. 2 steel is easier at $12 to $12.50, delivered, consuming plants. The export market on No. 1 steel continues at the reduced price noted last week of $12.50, Port Richmond; as this price still seems out of line with the export prices now being paid at certain other eastern ports, a further reduction is expected.

Buffalo—Scrap dealers have retired to the sidelines while they scout around to get material to ship on orders taken in the past six weeks. Probably 100,000 tons of scrap has been purchased from local dealers and shipments from distant points is probable to complete these orders. Last sales of No. 1 heavy melting steel were made at $14 and mills now offer $13.50 without attracting tonnage.

Detroit—A sagging market lost 25 to 50 cents a ton more on important classifications last week. Lists such as those sold by Chrysler and Pontiac at mid-week uncovered prices $1 to $1.25 per ton less than on their early April accumulations. The fast pace of automobile manufacturing produces more scrap than the market can steadily absorb, though dealers' yard stocks and other accumulations on the ground and dock here are negligible.

Cincinnati—Dealers' quotations on some grades of iron and steel scrap are lower. Mills for several months have refused to enter tonnage commitments, late 1935 contracts having played a major role in providing adequate supplies.

St. Louis—Following the recent purchase of 5000 to 6000 tons of heavy melting steel by an east side mill, buying of scrap has subsided and the trend of the market is slightly easier.

Withal, dealers are not disposed to sell short, and efforts are centered in securing material to apply on contracts. Offerings from all sources are in limited volume.

Birmingham, Ala.—Active demand

Behind the Scenes with STEEL

Rotogravure Section

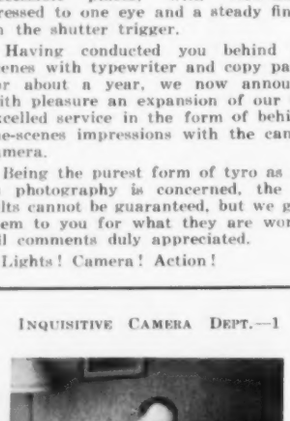
ALWAYS right up there fighting to keep in the swim, this department recently has become a candid cameraddict and may be seen dashing hither and yon from least accessible to most accessible places, with view-finder pressed to one eye and a steady finger on the shutter trigger.

Having conducted you behind the scenes with typewriter and copy paper for about a year, we now announce with pleasure an expansion of our unexcelled service in the form of behind-the-scenes impressions with the candid camera.

Being the purest form of tyro as far as photography is concerned, the results cannot be guaranteed, but we give them to you for what they are worth. All comments duly appreciated.

Lights! Camera! Action!

INQUISITIVE CAMERA DEPT.—1



E. C. "Ed" Barringer, managing editor of STEEL, *interrupted from his never-ending task of sifting and interpreting the news of the week for you readers.*

Out in Front

IN A RECENT advertisement of the Great Lakes Foundry Sand Co. was featured a large illustration of that company's reception room. What caught the promotional eye of our quondam artist, Mr. Etaoin, who referred the matter to us, was a stack of copies of STEEL at the front of a table of literature.

Thousands of companies make a practice of keeping weekly copies, after they have been routed through the organization, for visitors. Some even go so far as to subscribe to an extra copy each week, for the express purpose of reception-room tables, assuring callers of last-minute information on the production processing, distribution and use of steel and allied metals and materials. And, of course, many have their weekly copies bound into half-year volumes for permanent place in plant libraries.

* * *

Sunkist Steel

FROM the columns of the *Compressed Air Magazine* comes the information that California fruit growers have discovered that citrus fruit pulp acts "quicker than oil" as a quenching agent for heated steel and gives "equal or better results." One of their research experts recently reported that some steel companies are now experimenting with the new medium.

We know from first-hand experience that old orange-peel hemispheres make excellent quenching media for hot coffee grounds, but this new development catches us flatfooted. Look out, E. F. Houghton & Co., et al!

* * *

Note

SOMETIMES we think it might be advisable to start a series of articles on business letter writing. Certainly some choice specimens arrive here every once in a while. One of the latest:

Sir:—

Recently one of your representatives phoned me, reguesting a trial of your "Steel Magazine."

To dateI have received two copies, and in view of the fact that they do not fall in line with my work, bing of little value to me, I take this opportunity in asking you to kindly take my mane off of your mailing list.

* * *

Lingo

ONE of STEEL'S energetic editors stopped in our office the other morning and said: "Well, we had to railroad some late copy for the 6 o'clock form; it was several sticks of 8-point leaded on 13 ems and the operator slugged it for STEEL, add late news. They rushed the galleys to the stone and dropped the hot stuff in the form in a hurry; then whipped off a stoneproof and locked it up quickly, so we made the deadline O.K. Got a match?"

We gasped, gave him a match and, like a true printer, said the devil with it.

—SHRDLU

is being felt for certain grades of iron and steel scrap and dealers are in position to fill orders promptly. Prices are practically unchanged.

Seattle — Following six weeks of export activity, the market is weaker, prices having declined about 50 cents from $11 for No. 1 and $13 for rails, the high points reached during March. Japan is again well stocked and mills in that country have withdrawn. Some exporters anticipate a further price drop before Japan again shows interest. Local mills are buying sufficient for immediate requirements.

Toronto, Ont.—Outside of minor increase in shipments there has been practically no change in iron and steel scrap markets. Demand is sustained and consumers mostly are taking larger tonnages than at the beginning of the year. A few consumers have contracted for scrap for forward delivery but foundries and other small consumers are buying as demands dictate.

Warehouse

Warehouse Prices, Page 82

Cleveland—Warehouse business in April showed only slight improvement over March. During the past week the number of orders gained, but there was practically no change in size. Prices are steady.

Chicago—Local warehouses have issued new quantity differentials on galvanized and hot-rolled annealed sheets. Galvanized prices are: 400 pounds and less, 5.05c; 400-1499 pounds, 4.55c; 1500-3499 pounds, 4.30c; and 3500 pounds and over, 4.05c. Hot-rolled annealed prices are: 400 pounds and less, 4.35c; 400-1499 pounds, 3.85c; 1500-3499 pounds, 3.60c; and 3500 pounds and over, 3.35c. Base prices in each case are 400-1499 pounds. The 1500-3499 brackets are new and result in a 25-cent reduction for these quantities. Sales are well diversified. April volume showed a further slight expansion.

New York—Shipments of finished iron and steel products out of jobbers' stocks in April were at the heaviest rate in the past five years. There has been a slight letdown since the peak, however, indicating that May shipments will be smaller than those in April. Prices are unchanged.

Philadelphia—Pending final compilation, it appears as if most leading jobbers here experienced fully as good business in April as in March. Normally there is an easing off in May, although conditions this year have been so varied that jobbers are loath to make any firm predictions. Business so far this spring has been substantially in excess of that of a year ago. Prices are unchanged.

Detroit—Heavier inquiries are appearing for steel from die shops and tool makers, which augments a brisk rate of demand for warehouse steel products. Specifications and shipments, as reported by jobbers covering April, both were high for 1936. Prices are steady.

Cincinnati—Heavier individual orders, chiefly industrial, brought an increase in warehouse tonnage for April over March. Demand has remained broad, bu
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been moderate. P

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tanding items are sea-
or use in the rural areas.
the general manufactur-
are of considerable size,
ture plants taking approx-
5 per cent larger tonnages
ar ago. Prices are steady.

ancisco—Movement of ware-
aterials has shown a decided

SPUR GEAR REDUCERS

(PLANETARY DRIVE TYPE)

• *This type of reducer is sturdy, compact, durable, efficient, and is equipped with Timken Roller Bearings*

The D. O. James Planetary Spur Gear Reducer is superior to any other type, having a gear arrangement that produces the highest possible gear ratio.

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FOR ALMOST FIFTY YEARS MAKERS OF EVERY TYPE OF SPEED REDUCER AND CUT GEAR

improvement over the corresponding period last year, and demand continues strong. Warehouse price on No. 24 galvanized sheets in Los Angeles has been reduced from 4.95c to 4.40c.

Seattle—Jobbers report a satisfactory volume of business, although mill buying is not active. Demand from industrial plants is increasing, but public works jobs continue to furnish the bulk of the turnover. Prices are well stabilized. Some foreign steel, including shapes, bars, plates, sheets and tubing, is arriving, mainly for distribution in British Columbia.

Iron Ore

Iron Ore Prices, Page 81

Cleveland — Opening of Great Lakes navigation into Lake Superior and also out of the ice-beleagured Buffalo harbor was accomplished late Thursday afternoon, April 30. A fleet of five Cleveland-Cliffs vessels led by the steamer J. H. SHEADLE left the Soo and pushed slowly out into Lake Superior, anchoring at night near Whitefish Point before starting through ice floes at daylight bound for Duluth. At the latter port an adverse wind has blown broken ice back to shore, preventing two boats from leaving the harbor. However, Interlake steamer E. A. S. CLARKE is prepared to take the first ore of the season from the Great Northern docks. Hutchinson fleet's D. P. THOMPSON was the first to reach clear water out of Buffalo. Pittsburgh Steamship Co. captains and mates left for their boats Thursday after a two-day meeting at Cleveland. The Pittsburgh company started out its first ship of the season Friday for Gary, the AUGUST ZIESING, which loaded coal at Toledo.

Bulk freighter interests have taken large tonnage contracts from iron ore shippers for the 1936 season at unchanged vessel carrying rates from last year. On a net basis without unloading charge, they are 70 cents a ton from the head of the lakes to all lower lake ports, 63 cents from Marquette to lower lake ports, 52½ cents from Escanaba to Lake Erie ports, and 42 cents from Escanaba to South Chicago. Similarly, coal shippers have closed contracts with vessel interests to transport fuel for the season at unchanged rates from last year: 40 cents a ton net to the vessel to Duluth, 50 cents to Milwaukee and Chicago, and 45 cents to other points on Lake Michigan, as for instance Green Bay.

Rising demands from interior blast furnaces have made it necessary to add a third ore bridge crew at Conneaut, O., harbor for the first time in its history. Producers and consumers are completing arrangements for 1936 requirements under long-term contracts.

Charles Taylor Sons Co., Cincinnati, manufacturer of P. B. Sillimanite and fire clay refractories, has removed its eastern district offices to the Hudson Terminal building, 30 Church street, New York, effective May 1. Ripley Quinby is the district sales manager.

Metallurgical Coke

Coke Prices, Page 79

Beehive coke producers are still benefiting to a marked degree in the high rate of blast furnace activity in the western Pennsylvania district. Many blast furnace operators have preferred to buy beehive coke rather than increase their by-product coke operations. Based on present demand, standard beehive furnace coke for blast furnace use is firm at a range of $3.50 to $3.65, f.o.b. Connellsville, Pa., ovens. Similar brisk buying has continued in foundry coke and prices are based on $4.25 minimum for common grades with some sales up to $4.35, also f.o.b. Connellsville, Pa., and premium foundry coke is quotably unchanged at $5.35 to $5.50. Shipments at Chicago maintain the high rate of the past few weeks. Birmingham, Ala., producers have increased production to meet demand.

Ferroalloys

Ferroalloy Prices, Page 80

New York—All quotations on 50 per cent ferrosilicon have been reduced $8 a gross ton, effective May 1. The bulk carlot contract price now is $69.50. Other grades are unchanged.

Ferromanganese sellers have concluded one of the best months in a long time in point of shipments, and anticipate May will be almost as good. Much depends upon the trend in steelmaking, and at the moment no marked decline is in sight. The market is $75, duty paid, Atlantic and Gulf ports. Domestic spiegeleisen, 19 to 21 per cent is $26, Palmerton, Pa., on quantities up to 50 tons; and $24 on lots of 50 tons and over.

Nonferrous Metals

Nonferrous Metal Prices, Page 80

New York — Buying activity in lead was outstanding in major nonferrous metal markets last week. Zinc and copper sales were light but prices held steady.

Copper—Total sales for April were reported at 158,064 tons, the largest monthly volume on record. Sellers appeared satisfied with the current light sales rate and held prices firm on the basis of 9.50c, Connecticut, for electrolytic. Fabricators advanced copper and brass sheets ¼-cent, effec-

The "RIVITOR"

Feeds and Sets SOLID Rivets Automatically

THE WORK is placed over the locator in the anvil. The rivet is fed automatically into the jaws which are carried down by the ram. The head is formed underneath the work. A gain in strength from 10% to 19% is accomplished (over that of other type rivet joints.)

May we send you literature describing further the many advantages of this machine?

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tive Monday, May 4. Drawn copper bars and anodes were also raised a like amount.

Lead—All classes of consumers showed an active interest in the market with pigment and battery makers especially heavy buyers. If demand holds to an active rate over the next week or so, an early rise in prices would not be surprising. All sellers asked firm levels last week on the basis of 4.45c, East St. Louis, for prime western.

Zinc—Sales last week were confined to light tonnages to regular customers. Prices held rigid at 4.90c, East St. Louis. The firm undertone of the market reflects the anticipation that renewed active buying may develop at any time.

Tin—Buying was dull but prices firmed up toward the end of the week on the report that world visible supplies were cut 2746 tons during April. Spot and nearby supplies continued tight. Straits spot closed around 47.00c.

Antimony—Prices held unchanged in a quiet market at 13.50c, duty paid New York, for Chinese spot and 12.62½c for American spot.

Tin Plate

Tin Plate Prices, Page 78

Pittsburgh—Tin plate requirements for the manufacture of packers' cans, representing a wide variety of uses, are a dominant factor in tin plate demand. The outlook is further enhanced by the proximity of packer-can requirements for summer crops. Rolling in advance of requirements for the next 30 to 60 days, tin plate mills last week engaged at 90 per cent. Stocks of finished plate in mill warehouses are moving at a much brisker pace. Standard tin plate holds at $5.25 per base box, and tin mill sizes of black sheets, No. 28 gage, are quoted 2.75c.

Machinery Rate Uncertian

In the administration of the new tariff rates in the trade agreement with Canada, effective Jan. 1, the department of national revenue, Toronto, Ont., has ruled that machinery which may be claimed to be "of a class or kind not made in Canada" will pay the 25 per cent rate, pending a ruling by that department whether the particular shipment under consideration is in fact "of a class or kind not made in Canada." If the ruling is favorable, a refund will be made reducing the duty to 20 per cent, according to Lewis M. Lind, acting chief, machinery division, department of commerce, Washington.

Steel in Europe

Foreign Steel Prices, Page 82

London—(*By Radio*)—With most consumers well covered, buying of steel in Great Britain is quiet. Specifications against contracts are in heavy volume and mill deliveries are being retarded. Demand for finished materials is strong, with sheets the least active product. Because of heavy needs of domestic consumers export trade is receiving relatively little attention.

South Durham Steel & Iron Co., West Hartlepool, is undertaking works developments that will cost about £1,000,000.

The Continent reports export trade dull, except in semifinished steel for England. A contract for merchant bars for the Philippines is reported.

Equipment

Pittsburgh—Lewis Foundry & Machine Co., subsidiary of Blaw-Knox Co., has been awarded contract by Continental Steel Corp., Kokomo, Ind., for a completely mechanized three-high mill to be built for handling sheet bars up to 2-inch thickness.

Union Switch & Signal Co., Swissvale, Pa., subsidiary of Westinghouse Air Brake Co., is low bidder on interlocking equipment for the Interborough Rapid Transit Co., New York.

Seattle—Machinery and equipment required in lumbering, mining, the fishing industries and allied lines are in strong demand, dealers reporting improved turnover compared with last year. Industrial buying is increasing while public works projects continue to feature the market.

Chicago—Equipment sellers report district steel mills are expected to come into the market for more equipment shortly. Railroad shops are not buying as much as expected but the outlook here also is favorable. Makers of tractors and other farm equipment, along with automotive equipment plants, are the most active buyers. Small orders for one or two tools are increasing, but this business is being discouraged to some extent by the long wait for deliveries, which now are running ten to twelve weeks behind. More buying of small tools is noted.

The new type Chrysler steering wheel shown at the right is not only unique in design but it presents a difficult polishing and burnishing problem.

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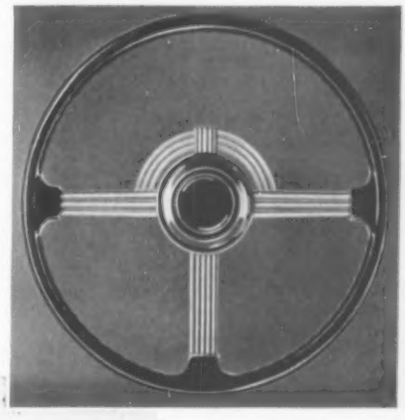

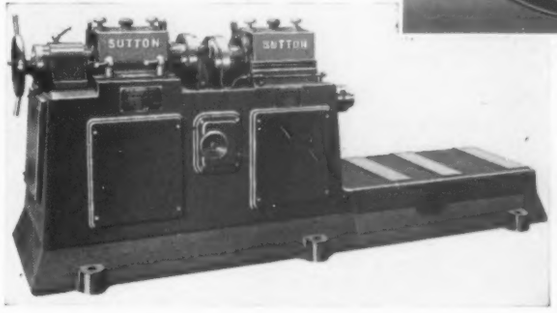

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Construction and Enterprise

Ohio

ADENA, O.—Village plans waterworks system, dependent on WPA approval. L. E. Burdick is village clerk, Frank Ritter, WPA director, district No. 3, Canton, O.

ASHLEY, O.—Village will take bids soon on construction of waterworks system to cost $49,000, to include pumphouse and elevated steel tank. Ray Whipple is mayor. Jennings & Lawrence, 12 North Third street, Columbus, O., engineers. (Noted STEEL April 13).

CLEVELAND—Passonno-Hutcheon Co., paint manufacturer, is building large addition to plant at 9808 Meech avenue, Northeast. Dunbar Co., 8201 Cedar avenue, has general contract.

CLEVELAND — Republic Steel Corp., Republic building, plans improvements at plants and mines to cost over $1,250,000. In the Youngstown, O. plant, nearly $560,000 will be spent in installation of a heat treating furnace with necessary auxiliary equipment, in the enlarging of some of the open-hearth furnaces, and in other smaller improvements.

Nearly $285,000 has been appropriated for improvements at the Corrigan-McKinney and the Steel & Tubes divisions. New electric welding equipment for medium size tubes will be installed at the Steel & Tubes plant.

General plant improvements at Central Alloy Steel Corp., and re-arrangement of shelving facilities and assembly lines at the Berger Mfg. Co., both in Canton, O., will cost more than $150,000.

Other renovating will include the following: Additional mining equipment and conveyors at the St. Paul mine near Hibbing, Minn., to cost approximately $95,000; increased capacity of the pumping station, enlargement of the pig iron storage facilities and installation of a fire protection system at the Buffalo plant, to cost $57,000; improving and electrifying of facilities of the Davidson mine near Uniontown, Pa., costing approximately $50,000; and various plant improvements at Warren, O., to cost $23,000.

Other cities which will benefit from the program to a lesser degree are Chicago, Birmingham, Ala., Massillon and Elyria, O., and Monroe, Mich.

DAYTON, O.—Hewitt Soup Co., 415 Linden avenue, plans two-story addition, to cost $50,000.

DAYTON, O.—Auto Electric Equipment Co. plant, 21 North St. Clair avenue, was damaged by fire April 26.

DAYTON, O.—Contracting officer, materiel division, Wright field, will take bids until May 7 for an engine, circular 36-802, and until May 21 for a winch, circular 36-801.

FOSTORIA, O.—Union Carbide & Carbon Corp., 30 East Forty-second street, New York, plans $200,000 addition to Fostoria plant, as part of 1936 $20,000,000 construction program. (Noted STEEL April 27).

HAMILTON, O.—City will take bids around May 11 for addition to light plant, to cost $464,000, including remodeling of present plant and installation of 10,000-kilowatt steam turbogenerator with accessory equipment. Engineers are Froelich & Emery, Second National Bank building, Toledo, O. (Noted STEEL April 13).

MINERVA, O.—Village council approved ordinance authorizing board of public affairs to ask bids on new generating equipment and additions to municipal power plant, work to cost $75,925. Ralph Hadlow, 5005 Euclid avenue, Cleveland, is engineer and head of board. (Noted STEEL March 16).

NEW LEXINGTON, O.—Village taking bids due noon May 9 for six-inch self-priming centrifugal pump with 30-40 horsepower gasoline engine and intake strainer, with necessary fittings. Mary Natcher is village clerk.

YOUNGSTOWN, O. — Youngstown Sheet & Tube Co., Stambaugh building, has authorized expenditure of $1,300,000 to increase the tin mill capacity at its Indiana Harbor plant and for the installation of a new turbine at the Campbell plant.

Connecticut

DANBURY, CONN. — Yameen Fur Co., 42 River street, plans rebuilding

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of two-story, 75 x 142-foot plant, recently damaged by fire.

HARTFORD, CONN. — City plans replacing Potter and Commerce street sewage disposal stations which were recently damaged by flood. R. N. Clark is city engineer, City hall.

NEW BRITAIN, CONN.—Board of water commissioners plans purchase of $50,000 steel standpipe. G. Molleur is city engineer.

NORWICH, CONN.—State tuberculosis commission, State Office building, Hartford, Conn., will take bids soon for construction of sewage disposal plant at Uncas-on-Thames sanatorium.

PORTLAND, CONN.—City is completing plans for sewage disposal plant. L. N. Germain, 135 Liberty street, Middletown, Conn., is engineer.

STRATFORD, CONN.—City surveying possibility of new sewage disposal system, to cost around $110,000, with pumping facilities and incinerator. W. Shea is city manager.

WATERBURY, CONN.—Waterbury Buckle Co., J. LaVigne general manager, plans plant addition on South Main street, to cost $40,000.

WATERBURY, CONN.—Lux Clock Mfg Co., 95 Johnson street, plans addition to plant to cost $65,000. Engineer is H. T. Moeckel, 33 Hill street, Naugatuck, Conn.

Massachusetts

ERVING, MASS.—Erving Paper Mill plans repairing one-story power plant, recently damaged by flood.

HADLEY, MASS.—Town plans rebuilding sewage disposal system, recently damaged by flood. F. H. Pelissier is clerk.

Vermont

BURLINGTON, VT.—Water department, City hall, plans water distribution system.

New York

BINGHAMTON, N. Y.—City has completed extensive survey of cost of rehabilitating waterworks system, to include purchase of pumps, filters and other equipment. E. H. Prentice is chairman of special commission which has recommended immediate action on improvements estimated to cost $900,000. G. A. Giles is city engineer, City hall.

BROOKLYN, N. Y.—Allied Industrial Alcohol Corp., 7 Van Brunt street, plans construction of steel storage tank to cost $25,000. E. M. Wharff, care of owner, is engineer.

BROOKLYN, N. Y.—Thirty-five Reuben Street Corp., 351 Park avenue, plans construction of two-story, 100 x 110-foot manufacturing plant to cost $110,000. Engineer is M. Klein, 45 Court street.

BUFFALO—Michigan Limestone & Chemical Co., foot of Catherine street, was damaged badly by fire last week.

DUNKIRK, N. Y.—Ludlum Steel Co., 66 Howard avenue, is taking bids on plant addition costing $55,000.

LONG ISLAND CITY, N. Y.—De Voe Iron Works Inc. has purchased a large plant at 33-35 Ninth street, Long Island City, and will remodel it.

MONTICELLO, N. Y.—A. H. Okun, engineer, 16 Starr avenue, is taking bids on 200,000-gallon steel water storage tank for Monticello Steam Laundry Co., 10 Johns street. Cost to be over $23,000.

NEW YORK—First & Fortieth Corp., 344 East Fortieth street, will probably receive bids after June 1 for three five-story factory buildings at 695 First avenue, to cost $45,000. J. Lubroth, 26 Court street, Brooklyn, N. Y., is architect.

PALMYRA, N. Y.—Garlock Packing Co. plans plant addition to cost $40,000.

PALMYRA, N. Y.—City plans new waterworks system to cost $36,000, and will vote on the measure soon.

SARANAC LAKE, N. Y.—City plans municipal electric power system, to cost $478,181, with PWA aid.

Pennsylvania

ALLENTOWN, PA.—City plans two new reservoirs for waterworks system, one to need 1500 tons of steel, the other 750 tons. Morris Knowles Inc., Westinghouse building, Pittsburgh, is engineer. PWA aid likely.

FRANKLIN, PA.—City plans purchase of chlorinator equipment and water-testing system at waterworks. J. Snow, city engineer, has been authorized to go ahead with plans.

Michigan

BAY CITY, MICH.—Kuhlman Electric Co., Twenty-sixth street and Jefferson avenue, has purchased the plant of the former Hunt Showcase Co., Twenty-sixth street and Garfield avenue, and will remodel it and install new machinery. J. A. Johnson is president of the Kuhlman company.

CLARE, MICH.—Clare Cabin Coach Co. has been incorporated by G. F. Fuller, Dolph Peck and D. Busche, all of Alma, Mich., to manufacture trailers in the former Borden Milk Co. plant.

DETROIT — Frederick Kahl Iron Foundry, 2111 East Atwater street, plans plant expansion to include installation of heavier crane equipment.

DETROIT—Lincoln Forging Co., 622 St. Antoine avenue, has been incorporated to do general forging. Harry V. Wilkie, 380 South Newport avenue, correspondent.

DETROIT—Difco Laboratories Inc., 920 Henry street, will build an addition and make alterations to boiler house. Architects are Donaldson & Meier, 1601 Washington building.

GRAND HAVEN, MICH.—Grand Haven Stamped Products Co. is starting construction of new plant addition.

LUDINGTON, MICH.—Park Dairy Co. plans construction of two-story ice cream plant, for which bids are being taken by Don Lakie, architect, 2160 Francis street, Southeast, Grand Rapids, Mich.

SAGINAW, Mich.—Saginaw Steering Gear Co., North Hamilton street, has awarded general contract for construction of plant to C. M. St. John Co., 1614 Sheridan avenue.

Illinois

ABINGDON, ILL.—Globe-Superior Corp. will receive bids soon for con-

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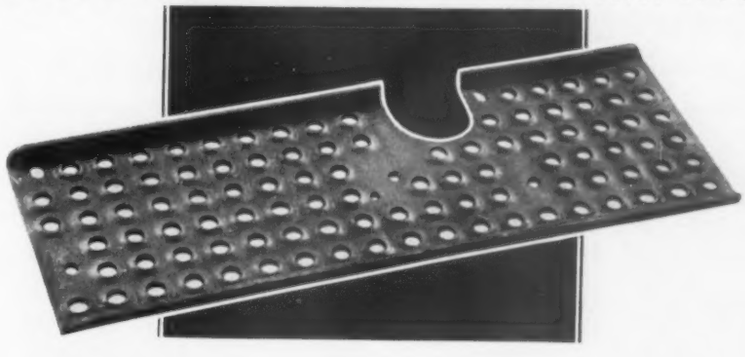

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struction of two-story, 95 x 130-foot, factory on North Main street. Aldrich & Aldrich, Bondi building, Galesburg, Ill., architects.

GLENWOOD, ILL.—City plans construction of sewage treatment plant in Glenwood Manual Training school. Engineers are Greeley & Hansen, 6 North Michigan avenue, Chicago.

GREAT LAKES, ILL.—Navy department plans improvement to sewage disposal plant at United States naval training station.

Indiana

DECATUR, IND.—Board of public works, City hall, will receive bids May 7 for 2000-kilowatt turbine, condenser, exciter and switchboard for light plant, total equipment to cost $60,000, PWA aid being sought. A. R. Holthouse is mayor. Bevington-Williams Inc., 1139 Indiana Pythian building, Indianapolis, engineer.

SOUTH BEND, IND.—City plans sewage disposal plant at proposed municipal airport. R. E. Keller, City hall, is engineer.

Alabama

BIRMINGHAM, ALA.—F. L. Kendig, 913 East Thirty-eighth street, is in the market for jaw crushers, one 12 x 26, the other 6 x 12 inches and for belt conveyors for the crushers.

Maryland

BALTIMORE—Flynn & Emrich Co., Grantley road and Western Maryland railroad, plans construction of one-story, 80 x 200-foot foundry to cost $50,000. Engineer is W. S. Austin, Maryland Trust building.

District of Columbia

WASHINGTON—Navy department, bureau of docks and yards, is taking bids on 5000-cubic-foot-per-minute air compressor, specification 8012.

WASHINGTON—Navy department, bureau of supplies and accounts, is taking bids due May 8 for chain hoists, schedule 7714; tinners' and sailmakers' shears, schedule 7722; hand drills, schedule 7711; and motor-driven die sinking and engraving machines, schedule 7690, all for delivery east and west coast points. Also for motor-driven router machines, schedule 7712, delivery Puget Sound, Wash., and motor-driven tilting combination saw, schedule 7693, for delivery Puget Sound, Wash. Bids are due May 12 for a motor-driven grinding machine, schedule 7753, delivery San Diego, Calif.

Kentucky

LEXINGTON, KY.—City has authorized engineers J. S. Watkins and Howard K. Bell to make survey of cost and possibilities of municipal water system.

Georgia

ALBANY, GA.—Cudahy Packing Co., 221 North La Salle street, Chicago, plans new packing plant here estimated to cost $500,000.

ATHENS, GA.—Rodgers Hosiery Co. Inc., Wyoming and Stenton avenues, Philadelphia, will erect $80,000 hosiery mill here.

ATLANTA, GA.—City plans addition to filter plant at waterworks, for which council is expected to vote an appropriation soon. L. A. Walker is city purchasing agent, City hall.

Louisiana

GRETNA, LA. — Johns-Manville Products Corp. reported planning construction of three new buildings, plans by George P. Rice, engineer, Baronne building, New Orleans. A boiler house and pump house will be included.

Mississippi

GULFPORT, MISS.—John McCullough plans erection of oil refinery, with two storage tanks.

NETTLETON, MISS.—Town will receive bids May 26 for construction of deep well, water pump distribution system, elevated tank, pumping station and disposal plant.

VICKSBURG, MISS.—United States engineer, P. O. box 667, will receive bids May 14 for diesel engine-driven generating set, 110 volts.

North Carolina

BRYSON CITY, N. C.—City plans waterworks improvements to cost $67,272, and is seeking PWA loan and grant. W. E. Elmore is mayor.

CORNELIUS, N. C.—City plans wa-

(*Please turn to Page* 104)

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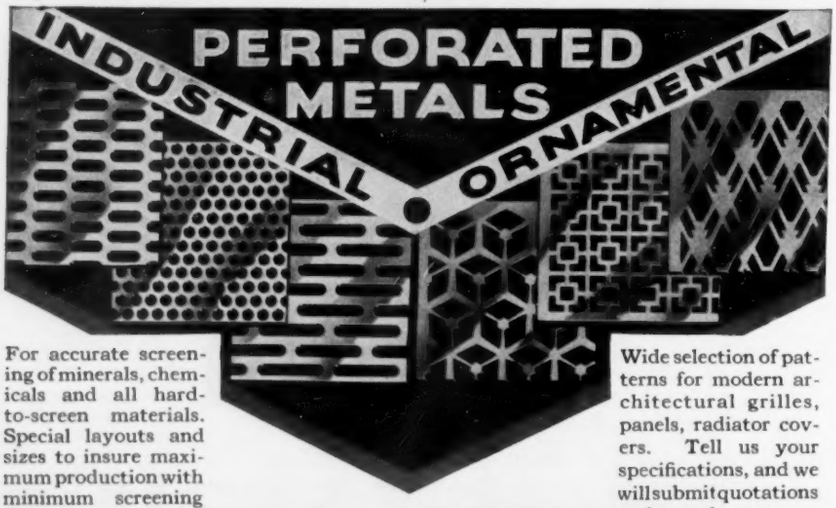

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*Republic Steel Corp., Dept. ST, Cleveland, O.
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Tennessee Coal, Iron & Railroad Co., Brown Marx Bldg., Birmingham, Ala.
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Youngstown Sheet & Tube Co., Youngstown, O.

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*Ludlum Steel Co., Watervliet, N. Y.
Ryerson, Jos. T., & Son, Inc., 16th and Rockwell Sts., Chicago, Ill.
Tennessee Coal, Iron & Railroad Co., Brown Marx Bldg., Birmingham, Ala.
Weirton Steel Co., Weirton, W. Va.
Youngstown Sheet & Tube Co., Youngstown, O.

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Boston Gear Works, Inc., North Quincy, Mass.
Fafnir Bearing Co., New Britain, Conn.
Norma Hoffmann Bearings Corp., Stamford, Conn.
New Departure Mfg. Co., Bristol, Conn.

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Cramp Brass & Iron Foundries Co., Paschall Sts., Philadelphia, Pa.
Lawrenceville Bronze Co., Bessemer Bldg., Pittsburgh, Pa.
National Bearing Metals Corp., 928 Shore Ave., Pittsburgh, Pa.
Rhoades, R. W., Metaline Co., 50—3rd St., Long Island City, N. Y.
Shenango-Penn Mold Co., Dover, O.

BEARINGS (Journal)
Bantam Ball Bearing Co., The, South Bend, Ind.
Fafnir Bearing Co., New Britain, Conn.
Hyatt Roller Bearing Co., P. O. Box 476, Newark, N. J.
Link-Belt Co., 300 W. Pershing Rd., Chicago, Ill.
National Bearing Metals Corp., 928 Shore Ave., Pittsburgh, Pa.
Timken Roller Bearing Co., The, Canton, O.

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BEARINGS (Radial)
Bantam Ball Bearing Co., South Bend, Ind.
Fafnir Bearing Co., New Britain, Conn.
Hyatt Roller Bearing Co., P. O. Box 476, Newark, N. J.
New Departure Mfg. Co., Bristol, Conn.
Timken Roller Bearing Co., Canton, O.

Bearings (Roll Neck)
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National Bearing Metals Corp., 928 Shore Ave., Pittsburgh, Pa.
Ryerson, Jos. T., & Son, Inc., 16th and Rockwell Sts., Chicago, Ill.
Timken Roller Bearing Co., Canton, O.

BEARINGS (Roller)
Bantam Ball Bearing Co., The, South Bend, Ind.
Fafnir Bearing Co., New Britain, Conn.
Hyatt Roller Bearing Co., P. O. Box 476, Newark, N. J.
Norma Hoffmann Bearings Corp., Stamford, Conn.
S K F Industries, Inc., Front St. & Erie Ave., Philadelphia, Pa.
Timken Roller Bearing Co., The, Canton, O.

BEARINGS (Roller Tapered)
Bantam Ball Bearing Co., South Bend, Ind.
Timken Roller Bearing Co., Canton, O.

BEARINGS (Rolling Mill)
Bantam Ball Bearing Co., South Bend, Ind.
Cramp Brass & Iron Foundries Co., Paschall Sts., Philadelphia, Pa
Hyatt Roller Bearing Co., P. O. Box 476, Newark, N. J.
Lawrenceville Bronze Co., Bessemer Bldg., Pittsburgh, Pa.
Norma Hoffmann Bearings Corp., Stamford, Conn.
Shoop Bronze Co., The, 344-360 W. Sixth St., Tarentum, Pa.
Timken Roller Bearing Co., Canton, O.

BEARINGS (Quill)
Bantam Ball Bearing Co., South Bend, Ind.

BEARINGS (Thrust)
Bantam Ball Bearing Co., The, South Bend, Ind.
Fafnir Bearing Co., New Britain, Conn.
Norma Hoffmann Bearings Corp., Stamford, Conn.
Timken Roller Bearing Co., The, Canton, O.

BELTING (Rubber)
Goodrich, B. F., Co., The, Akron, O.
U. S. Rubber Products, Inc., 1790 Broadway, New York City.

BENDING AND STRAIGHTENING MACHINES
Kardong Bros., 346 Buchanan St., Minneapolis, Minn.
Morgan Engineering Co., The, Alliance, O.
Thomas Spacing Machine Co., Pittsburgh, Pa.

(*Continued from Page* 102)

terworks improvements to cost $34,545. PWA approval, loan and grant has been sought. H. K. Sossoman is mayor.

HEMP, N. C.—City Engineer L. V. Edwards will receive bids May 6 for construction of sewage disposal plant and distribution system, to include chlorinator and 200,000-gallon elevated steel water tank and tower.

LINCOLNTON, N. C.—City plans waterworks improvements to cost $58,818, and has applied to PWA for loan and grant.

WINSTON-SALEM, N. C. — Dize Awning & Tent Co. is installing machines in plant on South Main street, for manufacture of Venetian blinds.

South Carolina

ROCK HILL, S. C.—Rock Hill Iron Works Inc. has been organized by W. E. Clark and W. J. Samet.

Tennessee

CHATTANOOGA, TENN.—L. J. Breed Equipment Co., 823 James building, is in the market for a 50-ton jaw crusher and a 50-ton pulverizer.

MEMPHIS, TENN.—United States engineer, P. O. box 97, will receive bids until May 8 for duplex steam pump, invoice 1092-36-287.

West Virginia

NITRO, W. VA.—Viscose Co., Marcus Hook, Pa., plans plant expansion at Nitro for manufacturing rayon yarn. An addition to the branch plant at Parkersburg, W. Va., may also be constructed.

Virginia

MARTINSVILLE, VA.—American Truck & Body Co., R. A. Fontaine manager, will erect plant on Smith river for manufacturing brick handling equipment.

SHENANDOAH, VA.—Shenandoah Milling Co. Inc., A. A. Roudahush, president, plans installing diesel engines in its plant.

Missouri

ST. LOUIS—Atlas Tool & Mfg. Co., 6319 Manchester avenue, has bought buildings at 5145 Natural Bridge avenue, and will spend $25,000 for addition.

Texas

ARP, TEX.—Arp Lumber Co. is rebuilding its burned lumber plant.

BROWNSVILLE, TEX.—Lovett & Kirk Canning Co. will erect an addition.

HEDLEY, TEX.—City plans sewage disposal system, to cost $28,500. E. L. Thompson is mayor. W. D. Howren engineer, Amarillo, Tex.

HOUSTON, TEX.—Continental Can Co., 100 East Forty-second street, New York, is taking bids on $250,000 plant to be built at Houston. Engineer is Robert J. Cummins, Bankers Mortgage building. This construction is part of $6,000,000 expansion program planned for 1936, to include new plants and additions at Memphis, Tenn., Baltimore and Wheeling, W. Va. (Noted STEEL April 13).

PHARR, TEX. — Miller & Scheer Packing Co. will rebuild packing plant.

TAFT, TEX. — City plans waterworks and natural gas improvements to cost $136,000. E. Burnet is mayor, and J. Ward, Wichita Falls, Tex., is engineer.

VICTORIA, TEX.—Victoria Central Iron Works has been incorporated by Joseph L. Conti and Samuel D. Denyer.

Wisconsin

ANTIGO, WIS.—Northwest Irrigation Co. has been incorporated by Earl Plantz, Harvey Guenther and Elza Reeve to manufacture patented pipe coupling.

LA CROSSE, WIS.—Trane Co., sheet metal manufacturer, plans plant expansion of 20,000 square feet.

MILWAUKEE—Chain Belt Co., 1600 West Bruce street, C. R. Messinger president, plans factory addition to cost $50,000.

MILWAUKEE—Decker Equipment Co., 1217 North Seventy-first street, has been incorporated to manufacture all-steel scaffolding. David E. Beatty is general manager.

WAUKESHA, WIS.—Michael Yundt Co., manufacturer of bottle-washing equipment for breweries and dairies.

(*Please turn to Page* 106)

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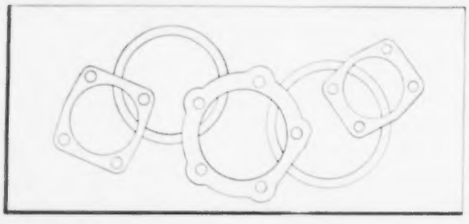

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WHERE-TO-BUY

BENZOL AND TOLUOL RECOVERY PLANTS
Koppers Construction Co., 1438 Koppers Bldg., Pittsburgh.
Youngstown Sheet & Tube Co., Youngstown, O.

BILLETS (Alloy and Carbon Steel)
Alan Wood Steel Co., Conshohocken, Pa.
Andrews Steel Co., Newport, Ky.
Carnegie-Illinois Steel Corp., Pittsburgh-Chicago.
Firth-Sterling Steel Co., McKeesport, Pa.
Republic Steel Corp., Dept. ST, Cleveland, O.
The Stanley Works, New Britain, Conn. Bridgeport, Conn.
Tennessee Coal, Iron & Railroad Co., Brown Marx Bldg., Birmingham, Ala.
Timken Steel & Tube Co., Canton, O.
Washburn Wire Co., Phillipsdale, R. I.

BILLETS (Forging)
Alan Wood Steel Co., Conshohocken, Pa.
Andrews Steel Co., Newport, Ky.
Carnegie-Illinois Steel Corp., Pittsburgh-Chicago.
Central Iron & Steel Co., Harrisburg, Pa.
Heppenstall Co., 47th & Hatfield Sts., Pittsburgh, Pa.
Jones & Laughlin Steel Corp., Jones & Laughlin Bldg., Pittsburgh, Pa.
Midvale Co., The, Nicetown, Philadelphia, Pa.
Republic Steel Corp., Dept. ST, Cleveland, O.
Standard Steel Works Co., Burnham, Pa.
The Stanley Works, New Britain, Conn. Bridgeport, Conn.
Tennessee Coal, Iron & Railroad Co., Brown Marx Bldg., Birmingham, Ala.
Timken Steel & Tube Co., Canton, O.

BILLETS AND BLOOMS (*Also Stainless)
Alan Wood Steel Co., Conshohocken, Pa.
Andrews Steel Co., Newport, Ky.
Bethlehem Steel Co., Bethlehem, Pa.
Carnegie-Illinois Steel Corp., Pittsburgh-Chicago.
Central Iron & Steel Co., Harrisburg, Pa.
Firth-Sterling Steel Co., McKeesport, Pa.
Inland Steel Co., 38 So. Dearborn St., Chicago, Ill.
Jones & Laughlin Steel Corp., Jones & Laughlin Bldg., Pittsburgh, Pa.
*Ludlum Steel Co., Watervliet, N. Y.
*Republic Steel Corp., Dept. ST, Cleveland, O.
Standard Steel Works Co., Burnham, Pa.
The Stanley Works, New Britain, Conn. Bridgeport, Conn.
Tennessee Coal, Iron & Railroad Co., Brown Marx Bldg., Birmingham, Ala.
Timken Steel & Tube Co., Canton, O.
Youngstown Sheet & Tube Co., Youngstown, O.

BINS (Storage)
Petroleum Iron Works Co., Sharon, Pa.

BLAST FURNACE FITTINGS
Pollock, The Wm. B., Co., Youngstown, O.

BLAST FURNACE SPECIALTIES
Bailey, Wm. M., Co., 702 Magee Bldg., Pittsburgh, Pa.
Brosius, Edgar E., Inc., Sharpsburg, Pa.
Leeds & Northrup Co., 4901 Stenton Ave., Philadelphia, Pa.
Pollock, The Wm. B., Co., Youngstown, O.
Shoop Bronze Co., The, 344-360 W. Sixth St., Tarentum, Pa.
Steel Industries Engineering Corp., Empire Bldg., Pittsburgh, Pa.

BLAST FURNACES—See FURNACES (Blast)

BLOCKS (Chain)
Ford Chain & Block Co., York, Pa.
Yale & Towne Mfg. Co., 4530 Tacony St., Philadelphia, Pa.

BLOWERS
Coppus Engineering Co., 359 Park Ave., Worcester, Mass.
General Electric Co., Schenectady, N. Y.
Ingersoll-Rand Co., Phillipsburg, N. J.
Strong, Carlisle & Hammond Co., The, 1400 W. 3rd St., Cleveland, O.

BLUE PRINTING EQUIPMENT AND SUPPLIES
Bruning, Chas., Co., Inc., 445 Plymouth Ave., Chicago, Ill.

BOILER HEADS
Bethlehem Steel Co., Bethlehem, Pa.

BOILER TUBES—See TUBES (Boiler)

BOILERS
Murray Iron Works Co., Burlington, Iowa.
Oil Well Supply Co., Dallas, Texas

BOLT AND NUT MACHINERY
Landis Machine Co., Waynesboro, Pa.

BOLTS (*Also Stainless)
Bethlehem Steel Co., Bethlehem, Pa.
Carnegie-Illinois Steel Corp., Pittsburgh-Chicago.
Columbia Steel Co., San Francisco, Calif.
Jones & Laughlin Steel Co., Jones & Laughlin Bldg., Pittsburgh, Pa.
Oliver Iron & Steel Corp., S. 10th & Muriel Sts., Pittsburgh, Pa.
*Republic Steel Corp., Upson Nut Div., Dept. ST, 1912 Scranton Rd., Cleveland, O.
Russell, Burdsall & Ward Bolt & Nut Co., Port Chester, N. Y.
Ryerson, Jos. T., & Son, Inc., 16th and Rockwell Sts., Chicago, Ill.
Tennessee Coal, Iron & Railroad Co., Brown Marx Bldg., Birmingham, Ala.

BORING MACHINES (Horizontal)
Landis Tool Co., Waynesboro, Pa.

BOSH PLATES (Copper)
Lawrenceville Bronze Co., Bessemer Bldg., Pittsburgh, Pa.

BOXES (Annealing)
Carnegie-Illinois Steel Corp., Pittsburgh-Chicago.
Petroleum Iron Works Co., Sharon, Pa.
Pollock, The Wm. B., Co., Youngstown, O.
United Engineering & Foundry Co., First National Bank Bldg., Pittsburgh, Pa.
Wilson, Lee, Engineering Co., 1370 Blount St., Cleveland, O.

BOXES (Case Hardening)
Driver-Harris Co., Harrison, N. J.
Strong, Carlisle & Hammond Co., The, 1400 W. 3rd St., Cleveland, O.

BOXES (Open Hearth Charging)
Carnegie-Illinois Steel Corp., Pittsburgh-Chicago.
Morgan Engineering Co., The, Alliance, O.
Petroleum Iron Works Co., Sharon, Pa.
Pollock, The Wm B., Co., Youngstown, O.
Wellman Engineering Co., 7000 Central Ave., Cleveland, O.

BRAKES (Electric)
Clark, The, Controller Co., 1146 E. 152nd St., Cleveland, O.

BRAKES (Press)
Cincinnati Shaper Co., Elam and Garrard Sts., Cincinnati, O.

BRICK—(Insulating)—See INSULATING BRICK

BRICK (Refractory)—See REFRACTORIES, CEMENT, etc.

BRICK (Silicon Carbide)
Carborundum Co., The, Perth Amboy, N. J.
Norton Co., Worcester, Mass.

BRIDGE CRANES (Ore and Coal Handling) See CRANES (Bridge)

BRIDGES, BUILDINGS, VIADUCTS, STACKS
American Bridge Co., Frick Bldg., Pittsburgh, Pa.
Belmont Iron Works, 22nd and Washington Ave., Philadelphia, Pa.
Bethlehem Steel Co., Bethlehem, Pa.
Columbia Steel Co., San Francisco, Calif.
Ohio Structural Steel Co., The, Newton Falls, O.
Petroleum Iron Works Co., Sharon, Pa.
Truscon Steel Co., Youngstown, O.

BRUSHES (Industrial)
Pittsburgh Plate Glass Co., Rennous-Kleinle Div., 3221 Frederick Rd., Baltimore, Md.

BUCKETS (Clam Shell, Dragline, Grab, Single Line)
Atlas Car & Mfg. Co., The, 1140 Ivanhoe Rd., Cleveland, O.
Harnischfeger Corp., 4411 W. National Ave., Milwaukee, Wis.
Industrial Brownhoist Corp., Bay City, Mich.
Link-Belt Co., 300 W. Pershing Rd. Chicago, Ill.
Wellman Engineering Co., 7000 Central Ave., Cleveland, O.

BUCKETS (Elevator)
Link-Belt Co., 307 No. Michigan Ave., Chicago, Ill.

BUILDINGS (Steel)—See BRIDGES, ETC.

BURNERS (Acetylene)—See TORCHES AND BURNERS

BURNERS (Automatic)
Kemp, C. M., Mfg. Co., 405 E. Oliver St., Baltimore, Md.
Surface Combustion Co., 2375 Dorr St., Toledo, O.
Wean Engineering Co., Warren, O.
Wilson, Lee, Engineering Co., 1370 Blount St., Cleveland, O.

BURNERS (Fuel, Oil, Gas, Combination)
Best, W. N., Engineering Co., 75 West St., New York City.
Surface Combustion Co., 2375 Dorr St., Toledo, O.
Wean Engineering Co., Warren, O.
Wilson, Lee, Engineering Co., 1370 Blount St., Cleveland, O.

BUSHINGS (Bronze)
Cadman, A. W., Mfg. Co., 2816 Smallman St., Pittsburgh, Pa.
Rhoades, R. W., Metaline Co., 50—3rd St., Long Island City, N. Y.
Shenango-Penn Mold Co., Dover, O.
Shoop Bronze Co., 344-60 W. 6th Ave., Tarentum, Pa.

BUSHINGS (Oilless)
Rhoades, R. W., Metaline Co., 50—3rd St., Long Island City, N. Y.

BUSINESS CARDS (Engraved)
Modern Card Co., 1153 Fullerton Ave., Chicago, Ill.

BY-PRODUCT PLANTS
Koppers Construction Co., 1438 Koppers Bldg., Pittsburgh, Pa.

CABLE GRIPS
Smith Devices 2245 No. 12th St., Philadelphia, Pa.

CADMIUM
The Udylite Co., 1615 E. Grand Blvd., Detroit, Mich.

CADMIUM PLATING PROCESS
The Udylite Co., 1615 E. Grand Blvd., Detroit, Mich.

CAR DUMPERS
Industrial Brownhoist Corp., Bay City, Mich.
Link-Belt Co., 300 W. Pershing Rd., Chicago, Ill.
Wellman Engineering Co., 7000 Central Ave., Cleveland, O.

CAR PULLERS and SPOTTERS
Link-Belt Co., 300 W. Pershing Rd., Chicago, Ill.

CARBIDE
Linde Air Products Co., 30 E. 42nd St., New York City.

CARBURIZERS
Houghton, E. F., & Co., 240 W. Somerset Ave., Philadelphia, Pa.

CARS (Charging)
Atlas Car & Mfg. Co., The, 1140 Ivanhoe Rd., Cleveland, O.
Carnegie-Illinois Steel Corp., Pittsburgh-Chicago.
Morgan Engineering Co., The, Alliance, O.
Pollock, The Wm. B., Co., Youngstown, O.
Wellman Engineering Co., 7000 Central Ave., Cleveland, O.

CARS (Industrial and Mining)
Atlas Car & Mfg. Co., 1140 Ivanhoe Rd., Cleveland.
Bethlehem Steel Co., Bethlehem, Pa.
Carnegie-Illinois Steel Corp., Pittsburgh-Chicago.
Petroleum Iron Works Co., Sharon, Pa.
Pollock, The Wm. B., Co., Youngstown, O.

CARS (Scale)
Atlas Car & Mfg. Co., The, 1140 Ivanhoe Rd., Cleveland, O.

CASTINGS (Acid Resisting)
Cadman, A. W., Mfg. Co., 2815 Smallman St., Pittsburgh, Pa.
Chain Belt Co., 1660 W. Bruce St., Milwaukee, Wis.
Farrel-Birmingham Co., Inc., 110 Main St., Ansonia, Conn. 344 Vulcan St., Buffalo, N. Y.
International Nickel Co., Inc., 67 Wall St., New York City.
Link-Belt Co., 300 W. Pershing Rd., Chicago, Ill.
National Bearing Metals Corp., 928 Shore Ave., Pittsburgh, Pa.
Shenango-Penn Mold Co., Dover, O.
Shoop Bronze Co., The, 344-360 W. Sixth St., Tarentum, Pa.
Wellman Bronze & Aluminum Co., 6017 Superior Ave., Cleveland, O.

CASTINGS (Alloy Steel)
Bethlehem Steel Co., Bethlehem, Pa.
Carnegie-Illinois Steel Corp., Pittsburgh-Chicago.
Damascus Steel Casting Co., The, New Brighton, Pa.
Forging & Casting Corp., The, Ferndale, Mich.
Industrial Steel Casting Co., 2237 Water Works Drive, Toledo, O.
Link Belt Co., 300 W. Pershing Rd., Chicago, Ill.
Pittsburgh Rolls Corp., 41st and Willow Sts., Pittsburgh, Pa.
Reliance Steel Casting Co., 2818 Smallman St., Pittsburgh, Pa.
Ryerson, Jos. T., & Son, Inc., 16th and Rockwell Sts., Chicago, Ill.
United Engineering & Fdry. Co., First National Bank Bldg., Pittsburgh, Pa.

CASTINGS (Brass, Bronze, Copper, Aluminum)
Aluminum Industries, Inc., 2348 Beekman St., Cincinnati, O.
Bethlehem Steel Co., Bethlehem, Pa.
Cadman, A. W., Mfg. Co., 2815 Smallman St., Pittsburgh, Pa.
Cramp Brass & Iron Foundries Co., Paschall Sts., Philadelphia, Pa.
Lawrenceville Bronze Co., Bessemer Bldg., Pittsburgh, Pa.

(*Concluded from Page* 104)

is building a shop addition, 32 x 64 feet.

Minnesota

EAST GRAND FORKS, MINN.—American Crystal Sugar Co. plans extensive building and remodeling program to plant, to cost $175,000, including installation of new equipment for loading and unloading, and other equipment. James B. Bingham is resident manager.

MINNEAPOLIS—Rodgers Hydraulic Press Co., 721 Laurel avenue, has been incorporated to manufacture hydraulic presses for use with heavy machinery and equipment. Incorporators are J. L., G. A., and J. S. Rodgers and E. E. Eder.

South Dakota

DRAPER, S. DAK.—City plans $25,000 waterworks system. J. Beach is auditor.

Iowa

DES MOINES, IOWA—New Monarch Machine & Stamping Co., Tenth and Murphy street, southwest, Sigurd E. Anderson president, plans rebuilding plant recently damaged by fire.

Nebraska

OMAHA, NEBR.—Gate City Iron Works, Eleventh and Seward streets, plans construction of plant addition to cost $40,000.

Colorado

GRAND JUNCTION, COLO.—City plans $55,000 waterworks and electric light plant improvements. F. Kennan, Grand Junction, Colo., engineer.

Nevada

BOULDER CITY, NEV.—Bureau of Reclamation, Denver, will receive bids May 18 for four 55,000-kilovolt, 60-cycle, single-phase, water-cooled transformers, for installation at Boulder Dam power plant.

Idaho

TWIN FALLS, IDAHO.—City plans construction of 85 x 100-foot steel hangar and machine shop at municipal airport, to cost $150,000. J. E. Hayes is mayor.

Pacific Coast

BURBANK, CALIF.—Three G Distillery, 3112 West San Fernando road, D. Greenberg president, plans addition to cost $25,000. Engineer is A. R. Sedgley, 910 North Serrano avenue, Los Angeles.

HUNTINGTON PARK, CALIF.—L. A. Young Spring & Wire Corp., 9200 Russell street, Detroit, has purchased factory building at 3350 East Slauson avenue, Huntington Park and is expanding 15,000 square feet, work with equipment to cost $250,000.

LOS ANGELES—Consolidated Steel Corp., 6500 East Slauson avenue, is constructing an addition for fabrication of reinforcing steel to cost $60,000. Reese Taylor is president.

LOS ANGELES—Directors of metropolitan water district, F. E. Weymouth engineer, 306 West Third street, receive bids May 12 for following synchronous motors, specification 153, for waterworks pumping plants: Six 6700-kilowatt, 9000-horsepower; three 3200-kilowatt, 4300 horsepower; six 9300 kilowatt, 12,500 horsepower.

MEDFORD, OREG.—Knight Packing Co. is enlarging its plant.

HOQUIAM, WASH.—Grays Harbor Pulp & Paper Co. is taking bids for construction of a boiler house.

Canada

WAWA, ONT.—Wawa Goldfields Ltd., A. C. Melkman manager, plans replacing present equipment in mine mill with electric-power driven machinery this summer.

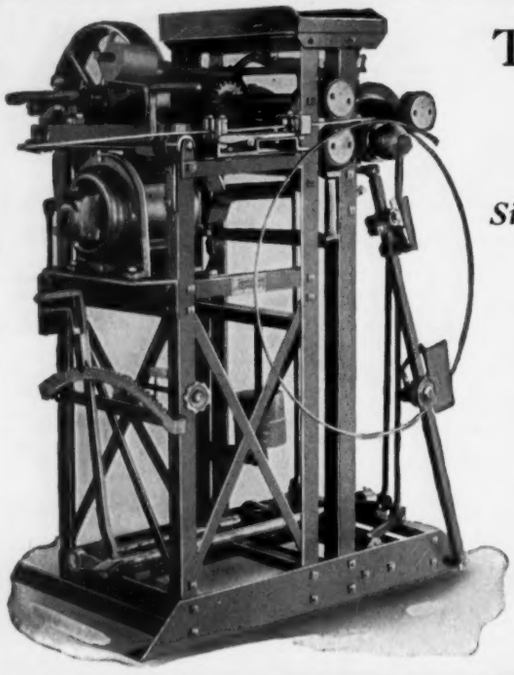
GRAND'MERE, QUE. — Village plans installation of automatic chlorinator at waterworks. J. C. Beigne is engineer.

NORANDA, QUE.—City plans new waterworks pumping station, to include one 3000-gallon-per-minute pump, and a 150-gallon-per-minute pump.

WOTTONVILLE, QUE. — Village plans extending present waterworks system, and to install 50 and 300-gallons-per-minute pumps and press tanks.

Foreign

RIVER SUIR, IRELAND—Allied Iron Works Ltd., West Bromwich, England, will build a new plant at River Suir, to cost $500,000.



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